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VOL. LII. JULY—DECEMBER, 1865.

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THE

RETROSPECT OF MEDICINE:

BEING

A HALF-YEARLY JOURNAL,

CONTAINING A RETROSPECTIVE VIEW OF EVERY DISCOVERY AND PRACTICAL IMPROVEMENT IN THE MEDICAL SCIENCES.

EDITED BY

W. BRAITHWAITE, M.D.,

LATE LECTURER ON MIDWIFERY AND THE DISEASES OF WOMEN AND CHILDREN AT THE LEEDS SCHOOL OF MEDICINE, ETC.

AND

JAMES BRAITHWAITE, M.D. Lond.

VOL. LII. JULY—DECEMBER,

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Parcels of Books, &c., to

Messrs. Simpkin, Marshall, & Co., London.

Certain portions of each Retrospect which embrace what we may call "Specialties" *are reprinted and made up into small Pamphlets; such as* "Diseases of the Eye," "Midwifery," "Cholera." *These Pamphlets may be useful to the busy Practitioner when he does not want the whole volume.*

D. I. Roebuck, Printer, 14, Trinity Street, Leeds.

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SYNOPSIS,

CONTAINING A SHORT ABSTRACT OF THE MOST PRACTICAL ARTICLES IN THE FOLLOWING PAGES: SHOWING, AT A GLANCE, THE MOST IMPORTANT INDICATIONS OF TREATMENT PUBLISHED BY DIFFERENT WRITERS WITHIN THE LAST HALF-YEAR. (ARRANGED ALPHABETICALLY.)

AFFECTIONS OF THE SYSTEM GENERALLY.

CONTAGIOUS FEVERS.—Fevers are due to the passage from one body to another of living particles. These living particles consist of germinal matter, and have descended by a process of degeneration from the germinal matter of the organism itself, and are therefore of animal origin. To those familiar with vital phenomena, the fact that a terrible and fatal malady may arise from the introduction into the body of a minute germ, weighing less than the $\frac{1}{100000}$ of a grain, will not appear incredible. (Dr. Lionel Beale, p. 18.)

FEVERS, TABES MESENTERICA, GASTRIC IRRITATION, &c.—Give the hypophosphite of lime, soda, or potash. The following formula for an infant is good: ℞. Hypophos. sodæ, gr. vi.; hypophos. calcis, hypophos. potass., ana gr. iv.; glycerinæ, ℥ii.; aquæ ℥i. M.; forty drops three times a day in a little water. The dose to be increased according to age. (Dr. H. S. Purday, p. 6.)

OZONE AS A DISINFECTANT.—Get a wide-necked bottle and put in half a pint of water, with a cork floating at the top, on this cork fix a bit of phosphorus; cover the bottle with another bit of cork very loosely. This apparatus may be moved from room to room remaining till the characteristic smell of ozone is perceived. Do this night and morning. (Dr. T. Moffatt, p. 19.)

SCARLET FEVER.—*Inunction with Hot Fat or Lard.*—Once or twice in the twenty-four hours let the patient be rubbed with hot fat or lard. This checks and quells the violence of the disorder in an extraordinary manner. Death is a rare result, and dropsical symptoms are almost unknown. The pulse will sometimes fall thirty beats in three hours. (Mr. J. L. Milton, p. 27.)

Cold Affusion.—Cold affusion is a plan attended with such benefit in cases of scarlet fever, with sthenic febrile symptoms,

that one is puzzled to know how it has come to be abandoned. (Mr. J. L. Milton, p. 28.)

Zymotic Diseases.—The fermentation of poisons in the system, generating zymotic diseases, may be arrested by the alkaline sulphites, the same as vinous fermentation is arrested by sulphurous acid. Therefore in typhus, typhoid, scarlatina, small-pox, &c., give scruple doses of sulphite of soda every three or four hours. This dose may be decreased or increased according to circumstances and age. (Dr. De 'Ricci, p. 1.)

AFFECTIONS OF THE NERVOUS SYSTEM.

Cerebral Paralysis.—*Faradization.*—Faradization is useful in cases of hemiplegia after the complete formation of the apoplectic cyst, when there is no longer any irritation within the cranium. It is more suitable to cases where the arm or leg are nearly or entirely useless than to those where there is much muscular rigidity. (Dr. J. Althaus, p. 49.)

Chorea.—*Calabar Bean.*—In a case of chorea recorded, four drops of a tincture of calabar bean were given thrice daily, and gradually increased in quantity during a period of nine weeks. Complete recovery resulted. All means previously tried during the course of several months had proved useless. (Dr. J. W. Ogle, p. 71.)

Delirium Tremens.—*Subcutaneous Injection of Morphia.*—In cerebral affections, medicines called anodynes when introduced subcutaneously, frequently act so far more effectually, and so differently from the stomachic doses of the same, as almost to warrant us in considering them as different medicines. Thus in delirium tremens, half-grain doses of morphia may be given repeatedly without effect, whilst one such dose introduced subcutaneously will frequently produce sleep. The use of the drug in this manner, moreover, is not followed by dryness of the mouth, and sickness and constipation of the bowels. (Mr. C. Hunter, p. 87.)

Epilepsy.—*Ice to the Spine.*—A most interesting case is related in which the patient was cured of severe epilepsy of long standing, by means of ice to the spine. He had many symptoms of spinal and cerebral irritation. Ice was applied along the whole spine during two hours, four times in each twenty-four hours, one bag being applied at bed-time, one being used during the night, and the other two during the day. He had no fit after this treatment was commenced, although previously he had three fits a day. The cure was permanent. (Dr. J. Chapman, p. 64.)

Incurable and Painful Diseases.—*Subcutaneous Injection of Morphia.*—By means of subcutaneous injection life in these cases is made bearable. It may for a long time prove a boon to patients suffering from incurable neuralgia, cancer, or the agony of diseased joints. One-third of a grain of morphia introduced subcutaneously every alternate day, will sometimes give all the relief that two grains given daily had previously done. (Mr. C. Hunter, p. 90.)

Insanity.—In cases where there is a determination of blood to the brain, with sleeplessness, restlessness, and anxiety, the following plan of treatment, with the object of drawing the blood from the brain, may be pursued with benefit. Let the whole legs and lower part of the abdomen be wrapped up in cloths steeped in mustard and hot water. A wet towel should be applied round the head. The effects are most soothing. (Dr. S. Newington, p. 72.)

Insomnia.—In cases of insomnia bromide of potassium can almost always be used with advantage, to diminish the amount of blood in the brain, and to allay any excitement of the nervous system. (Dr. W. A. Hammond, p. 74.)

Neuralgia.—*Hypophosphites.*—Try hypophosphite of soda in doses of a drachm three times a day in beef-tea. (Dr. T. H. Jackson, p. 70.)

Hypodermic Injection.—When opiates or other anodynes are injected subcutaneously for the relief of a local neuralgia, it is quite unnecessary to inject the neuralgic site : the medicine will act just as well when inserted in any other part of the body. (Mr. C. Hunter, p. 82.)

Paralysis.—*Electricity.*—The interrupted or electro-magnetic current proves useful in local paralysis due to injury of the motor nerves and muscles by pressure, rheumatic effusions, poisoning by lead, &c. The continuous galvanic current, known as "galvanization," on the other hand, proves useful chiefly in forms of paralysis due to affections of the nervous centres. (Dr. J. Althaus, p. 47.)

Paralysis from Pressure on Nervous Plexuses.—Cases of loss of power from continued pressure, especially of the head on the arm during intoxication either by chloroform or alcohol, are generally curable by faradization. (Dr. J. Althaus, p. 50.)

Rheumatic Paralysis.—Cases of loss of power in the extremities arising from exposure to cold and damp, even if of a severe kind and of long standing, are generally relieved by faradization, which also relieves the muscular pains, which are sometimes very severe. (Dr. J. Althaus, p. 59.)

Sciatica.—*Croton Oil.*—Give a dose of two drops of croton oil; in many cases cessation of the pain will immediately ensue on the copious action of the medicine. (Dr. S. C. Sewell, p. 67.)

Subcutaneous Injection of Atropine.—A lady had suffered from sciatica for two years, for which she had been obliged to take morphia daily. The subcutaneous injection of $\frac{1}{30}$ of a grain of atropine produced its characteristic phenomena upon the system, and forthwith removed the pain permanently. (Mr. C. Hunter, p. 84.)

Danger of Subcutaneous Injections.—Be very careful not to inject into a subcutaneous vein instead of into the cellular tissue. As it may be impossible to avoid this at all times, always inject very slowly—in order that at the first sign of danger, the injection may be stopped. (Prof. Nassbaum, p. 91.)

Spinal Pain.—In all cases of chronic pain on either side of the spine, attended with even the *slightest* undue prominence of the muscles over the transverse processes, an anatomical lesion of the ligamentous and bony part of the spine exists, combined with deviation of the bodies of the vertebræ and rotation. The term hysterical pain is incorrect. For the relief and cure of these cases mechanical means are requisite. (See description of instrument, page 62.) In cases where the general health is disturbed, appropriate means must be adopted. (Dr. H. Dick, p. 61.)

Tic-Douloureux.—*Subcutaneous Injection of Atropine.*—Inject $\frac{1}{30}$ of a grain of atropine subcutaneously, and repeat occasionally at intervals of two or three days if necessary. It is not necessary to inject it in the region of the pain. (Mr. C. Hunter, p. 84.)

AFFECTIONS OF THE CIRCULATORY SYSTEM.

Arterial Hemorrhage.—To *tie arteries*, use the *reef-knot* as figured and described at page 186. This method has the advantages of the common ligature and acupressure combined. You can tie the artery securely, and loose the knot at any moment without disturbing the parts, thus obviating the objection of allowing the ligature to remain till it separates in the usual way. (Mr. F. Churchill, p. 185.)

Heart Affections.—*Action of Digitalis in.*—Nothing seems more certain than the action of digitalis on the heart. When there is hypertrophy, its administration is dangerous; but in a weak organ, acting, because of its weakness, with great rapidity, it will reduce the number of its contractions, and, as it were, strengthen or tone them down. In a case of val-

vular heart disease, with dropsy of the legs and abdomen, the use of digitalis in ten drop doses was followed by the disappearance of the dropsy and the reappearance of the pulse at the wrist. (Dr. W. Murray, p. 98.)

No fact is now better established in medicine than that digitalis is capable of diminishing the frequency of the heart's beat, and of increasing the power of the heart's impulse. Nevertheless, when digitalis is given in such cases, the patient ought to be watched day by day, and the medicine discontinued as soon as the heart begins to be more regular and the impulse stronger. There is no proof that sudden death ever results from the administration of digitalis. This is liable to occur in any patient with dilated and feeble left ventricle, whether digitalis is given or not. (Dr. Gull, p. 91.)

Popliteal Aneurism.—*Digital pressure.*—A very successful cure of a popliteal aneurism is recorded by Mr. Porter of Dublin, in which by digital pressure only, the aneurism became perfectly solid in twenty-seven hours. No matter how carefully applied, instrumental pressure cannot be borne so long as can the finger tip; and further, the artery cannot be isolated so completely from its accompanying vein by mechanical as by digital compression, and therefore, œdema of the limb is more likely to ensue. There is less likelihood of ulceration or sloughing of the skin occurring than when instrumental pressure is used, for a less amount of force suffices to control the current of blood through the artery, and the point of pressure can with such ease be changed to a higher or lower position. The pressure must be effected by placing the points of the middle and index fingers of the left hand over the femoral artery where it crosses the brim of the pelvis, then by fixing and increasing the pressure by placing the middle and ring fingers of the right hand on those already over the vessel. The pulsation of the tumour must be arrested as much as possible, and the pressure kept up by fresh assistants relieving each other every two hours. (Mr. G. H. Porter, p. 183.)

AFFECTIONS OF THE RESPIRATORY SYSTEM.

Laryngoscopy.—There is generally an unpleasant glare in the eyes of the operator, owing to his facing the source of light. This may be avoided by the simple device of a black shade over the eyes, the shade being placed beneath the reflector on the forehead, and fastened by two hooks and eyes to the band which passes round the head. (Dr. G. Johnson, p. 106.)

Diseases of the Larynx and Pharynx.—*Inhalation of Atomized Fluids.*—By means of the little tubes, now seen in

every druggist's window, for blowing out a fine cloud of scent, &c., various medicated fluids may be atomized and applied directly to the mucous membrane of the throat and larynx in a more effectual way than by the brush. In inflammatory states, solution of nitrate of silver may be thus applied, and nitrate of aluminium if a milder agent is required. Solutions of tannin, alum, sesquichloride of iron, corrosive sublimate, sulphate of zinc, and even common salt, are useful in various cases. In nervous affections of the larynx, preparations of opium, and salts of iodine or bromine may be used. (Dr. Beigel, p. 102.)

AFFECTIONS OF THE DIGESTIVE SYSTEM.

Azoturia.—A patient suffering from azoturia appears at first to have no tangible disease, but his urine is found habitually of a high specific gravity, and containing a large amount of urea. The general symptoms are debility, dyspepsia, and a kind of indefinable malaise. Dr. Prout considered that these cases generally pass into diabetes, or some other formidable disease. The best medicinal remedies are mineral acids, opiates, and tonics of various kinds. (Dr. E. H. Sieveking, p. 121.)

Chronic Ulcer of the Tongue.—In a case of ulcer of the tongue of twenty years' standing, the following treatment rapidly procured the healing of the sore. Its syphilitic origin was questionable. Four minims of Fowler's solution of arsenic were taken three times a day, and a mercurial bath twice a week, the ulcer being touched daily with nitrate of copper. After twenty-five days, Donovan's solution of arsenic iodine and mercury was given in doses of twenty minims twice a day. The ulcer rapidly healed. (Dr. A. Leared, p. 261.)

Flatulence.—*Charcoal.*—Charcoal when introduced into the stomach in a dry and fresh state has the property of absorbing gases. It may be given freshly prepared and hermetically sealed in gelatine capsules. Three or four capsules are generally sufficient to give complete relief in cases of flatulence. The best charcoal for this purpose is made from vegetable ivory, and must not be finely powdered. It has been shown by direct experiment that twenty grains, or two capsules of the vegetable ivory charcoal, absorbs two-and-a-half cubic inches of carbonic acid gas. (Dr. A. Leared, p. 107.

Hemorrhoids.—An ointment of persulphate of iron (℥ss.—℥j. ad oz.) in hemorrhoids is an excellent application when they are ulcerated, or when the constitution is weakened by diarrhœa or excessive fatigue. (Assistant-Surgeon Cartwright, p. 203.)

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SYNOPSIS,

CONTAINING A SHORT ABSTRACT OF THE MOST PRACTICAL ARTICLES IN THE FOLLOWING PAGES: SHOWING, AT A GLANCE, THE MOST IMPORTANT INDICATIONS OF TREATMENT PUBLISHED BY DIFFERENT WRITERS WITHIN THE LAST HALF-YEAR. (ARRANGED ALPHABETICALLY.)

AFFECTIONS OF THE SYSTEM GENERALLY.

CONTAGIOUS FEVERS.—Fevers are due to the passage from one body to another of living particles. These living particles consist of germinal matter, and have descended by a process of degeneration from the germinal matter of the organism itself, and are therefore of animal origin. To those familiar with vital phenomena, the fact that a terrible and fatal malady may arise from the introduction into the body of a minute germ, weighing less than the $\frac{1}{100000}$ of a grain, will not appear incredible. (Dr. Lionel Beale, p. 18.)

FEVERS, TABES MESENTERICA, GASTRIC IRRITATION, &c.—Give the hypophosphite of lime, soda, or potash. The following formula for an infant is good: ℞. Hypophos. sodæ, gr. vi.; hypophos. calcis, hypophos. potass., ana gr. iv.; glycerinæ, ℥ii.; aquæ ℥i. M.; forty drops three times a day in a little water. The dose to be increased according to age. (Dr. H. S. Purday, p. 6.)

OZONE AS A DISINFECTANT.—Get a wide-necked bottle and put in half a pint of water, with a cork floating at the top, on this cork fix a bit of phosphorus; cover the bottle with another bit of cork very loosely. This apparatus may be moved from room to room remaining till the characteristic smell of ozone is perceived. Do this night and morning. (Dr. T. Moffatt, p. 19.)

SCARLET FEVER.—*Inunction with Hot Fat or Lard.*—Once or twice in the twenty-four hours let the patient be rubbed with hot fat or lard. This checks and quells the violence of the disorder in an extraordinary manner. Death is a rare result, and dropsical symptoms are almost unknown. The pulse will sometimes fall thirty beats in three hours. (Mr. J. L. Milton, p. 27.)

Cold Affusion.—Cold affusion is a plan attended with such benefit in cases of scarlet fever, with sthenic febrile symptoms,

that one is puzzled to know how it has come to be abandoned. (Mr. J. L. Milton, p. 28.)

Zymotic Diseases.—The fermentation of poisons in the system, generating zymotic diseases, may be arrested by the alkaline sulphites, the same as vinous fermentation is arrested by sulphurous acid. Therefore in typhus, typhoid, scarlatina, small-pox, &c., give scruple doses of sulphite of soda every three or four hours. This dose may be decreased or increased according to circumstances and age. (Dr. De 'Ricci, p. 1.)

AFFECTIONS OF THE NERVOUS SYSTEM.

Cerebral Paralysis.—*Faradization.*—Faradization is useful in cases of hemiplegia after the complete formation of the apoplectic cyst, when there is no longer any irritation within the cranium. It is more suitable to cases where the arm or leg are nearly or entirely useless than to those where there is much muscular rigidity. (Dr. J. Althaus, p. 49.)

Chorea.—*Calabar Bean.*—In a case of chorea recorded, four drops of a tincture of calabar bean were given thrice daily, and gradually increased in quantity during a period of nine weeks. Complete recovery resulted. All means previously tried during the course of several months had proved useless. (Dr. J. W. Ogle, p. 71.)

Delirium Tremens.—*Subcutaneous Injection of Morphia.*—In cerebral affections, medicines called anodynes when introduced subcutaneously, frequently act so far more effectually, and so differently from the stomachic doses of the same, as almost to warrant us in considering them as different medicines. Thus in delirium tremens, half-grain doses of morphia may be given repeatedly without effect, whilst one such dose introduced subcutaneously will frequently produce sleep. The use of the drug in this manner, moreover, is not followed by dryness of the mouth, and sickness and constipation of the bowels. (Mr. C. Hunter, p. 87.)

Epilepsy.—*Ice to the Spine.*—A most interesting case is related in which the patient was cured of severe epilepsy of long standing, by means of ice to the spine. He had many symptoms of spinal and cerebral irritation. Ice was applied along the whole spine during two hours, four times in each twenty-four hours, one bag being applied at bed-time, one being used during the night, and the other two during the day. He had no fit after this treatment was commenced, although previously he had three fits a day. The cure was permanent. (Dr. J. Chapman, p. 64.)

Incurable and Painful Diseases.—*Subcutaneous Injection of Morphia.*—By means of subcutaneous injection life in these cases is made bearable. It may for a long time prove a boon to patients suffering from incurable neuralgia, cancer, or the agony of diseased joints. One-third of a grain of morphia introduced subcutaneously every alternate day, will sometimes give all the relief that two grains given daily had previously done. (Mr. C. Hunter, p. 90.)

Insanity.—In cases where there is a determination of blood to the brain, with sleeplessness, restlessness, and anxiety, the following plan of treatment, with the object of drawing the blood from the brain, may be pursued with benefit. Let the whole legs and lower part of the abdomen be wrapped up in cloths steeped in mustard and hot water. A wet towel should be applied round the head. The effects are most soothing. (Dr. S. Newington, p. 72.)

Insomnia.—In cases of insomnia bromide of potassium can almost always be used with advantage, to diminish the amount of blood in the brain, and to allay any excitement of the nervous system. (Dr. W. A. Hammond, p. 74.)

Neuralgia.—*Hypophosphites.*—Try hypophosphite of soda in doses of a drachm three times a day in beef-tea. (Dr. T. H. Jackson, p. 70.)

Hypodermic Injection.—When opiates or other anodynes are injected subcutaneously for the relief of a local neuralgia, it is quite unnecessary to inject the neuralgic site : the medicine will act just as well when inserted in any other part of the body. (Mr. C. Hunter, p. 82.)

Paralysis.—*Electricity.*—The interrupted or electro-magnetic current proves useful in local paralysis due to injury of the motor nerves and muscles by pressure, rheumatic effusions, poisoning by lead, &c. The continuous galvanic current, known as "galvanization," on the other hand, proves useful chiefly in forms of paralysis due to affections of the nervous centres. (Dr. J. Althaus, p. 47.)

Paralysis from Pressure on Nervous Plexuses.—Cases of loss of power from continued pressure, especially of the head on the arm during intoxication either by chloroform or alcohol, are generally curable by faradization. (Dr. J. Althaus, p. 50.)

Rheumatic Paralysis.—Cases of loss of power in the extremities arising from exposure to cold and damp, even if of a severe kind and of long standing, are generally relieved by faradization, which also relieves the muscular pains, which are sometimes very severe. (Dr. J. Althaus, p. 59.)

Sciatica.—*Croton Oil.*—Give a dose of two drops of croton oil; in many cases cessation of the pain will immediately ensue on the copious action of the medicine. (Dr. S. C. Sewell, p. 67.)

Subcutaneous Injection of Atropine.—A lady had suffered from sciatica for two years, for which she had been obliged to take morphia daily. The subcutaneous injection of $\frac{1}{30}$ of a grain of atropine produced its characteristic phenomena upon the system, and forthwith removed the pain permanently. (Mr. C. Hunter, p. 84.)

Danger of Subcutaneous Injections.—Be very careful not to inject into a subcutaneous vein instead of into the cellular tissue. As it may be impossible to avoid this at all times, always inject very slowly—in order that at the first sign of danger, the injection may be stopped. (Prof. Nassbaum, p. 91.)

Spinal Pain.—In all cases of chronic pain on either side of the spine, attended with even the *slightest* undue prominence of the muscles over the transverse processes, an anatomical lesion of the ligamentous and bony part of the spine exists, combined with deviation of the bodies of the vertebræ and rotation. The term hysterical pain is incorrect. For the relief and cure of these cases mechanical means are requisite. (See description of instrument, page 62.) In cases where the general health is disturbed, appropriate means must be adopted. (Dr. H. Dick, p. 61.)

Tic-Doloureux.—*Subcutaneous Injection of Atropine.*—Inject $\frac{1}{30}$ of a grain of atropine subcutaneously, and repeat occasionally at intervals of two or three days if necessary. It is not necessary to inject it in the region of the pain. (Mr. C. Hunter, p. 84.)

AFFECTIONS OF THE CIRCULATORY SYSTEM.

Arterial Hemorrhage.—To *tie arteries*, use the *reef-knot* as figured and described at page 186. This method has the advantages of the common ligature and acupressure combined. You can tie the artery securely, and loose the knot at any moment without disturbing the parts, thus obviating the objection of allowing the ligature to remain till it separates in the usual way. (Mr. F. Churchill, p. 185.)

Heart Affections.—*Action of Digitalis in.*—Nothing seems more certain than the action of digitalis on the heart. When there is hypertrophy, its administration is dangerous; but in a weak organ, acting, because of its weakness, with great rapidity, it will reduce the number of its contractions, and, as it were, strengthen or tone them down. In a case of val-

vular heart disease, with dropsy of the legs and abdomen, the use of digitalis in ten drop doses was followed by the disappearance of the dropsy and the reappearance of the pulse at the wrist. (Dr. W. Murray, p. 98.)

No fact is now better established in medicine than that digitalis is capable of diminishing the frequency of the heart's beat, and of increasing the power of the heart's impulse. Nevertheless, when digitalis is given in such cases, the patient ought to be watched day by day, and the medicine discontinued as soon as the heart begins to be more regular and the impulse stronger. There is no proof that sudden death ever results from the administration of digitalis. This is liable to occur in any patient with dilated and feeble left ventricle, whether digitalis is given or not. (Dr. Gull, p. 91.)

Popliteal Aneurism.—*Digital pressure.*—A very successful cure of a popliteal aneurism is recorded by Mr. Porter of Dublin, in which by digital pressure only, the aneurism became perfectly solid in twenty-seven hours. No matter how carefully applied, instrumental pressure cannot be borne so long as can the finger tip; and further, the artery cannot be isolated so completely from its accompanying vein by mechanical as by digital compression, and therefore, œdema of the limb is more likely to ensue. There is less likelihood of ulceration or sloughing of the skin occurring than when instrumental pressure is used, for a less amount of force suffices to control the current of blood through the artery, and the point of pressure can with such ease be changed to a higher or lower position. The pressure must be effected by placing the points of the middle and index fingers of the left hand over the femoral artery where it crosses the brim of the pelvis, then by fixing and increasing the pressure by placing the middle and ring fingers of the right hand on those already over the vessel. The pulsation of the tumour must be arrested as much as possible, and the pressure kept up by fresh assistants relieving each other every two hours. (Mr. G. H. Porter, p. 183.)

AFFECTIONS OF THE RESPIRATORY SYSTEM.

Laryngoscopy.—There is generally an unpleasant glare in the eyes of the operator, owing to his facing the source of light. This may be avoided by the simple device of a black shade over the eyes, the shade being placed beneath the reflector on the forehead, and fastened by two hooks and eyes to the band which passes round the head. (Dr. G. Johnson, p. 106.)

Diseases of the Larynx and Pharynx.—*Inhalation of Atomized Fluids.*—By means of the little tubes, now seen in

every druggist's window, for blowing out a fine cloud of scent, &c., various medicated fluids may be atomized and applied directly to the mucous membrane of the throat and larynx in a more effectual way than by the brush. In inflammatory states, solution of nitrate of silver may be thus applied, and nitrate of aluminium if a milder agent is required. Solutions of tannin, alum, sesquichloride of iron, corrosive sublimate, sulphate of zinc, and even common salt, are useful in various cases. In nervous affections of the larynx, preparations of opium, and salts of iodine or bromine may be used. (Dr. Beigel, p. 102.)

AFFECTIONS OF THE DIGESTIVE SYSTEM.

Azoturia.—A patient suffering from azoturia appears at first to have no tangible disease, but his urine is found habitually of a high specific gravity, and containing a large amount of urea. The general symptoms are debility, dyspepsia, and a kind of indefinable malaise. Dr. Prout considered that these cases generally pass into diabetes, or some other formidable disease. The best medicinal remedies are mineral acids, opiates, and tonics of various kinds. (Dr. E. H. Sieveking, p. 121.)

Chronic Ulcer of the Tongue.—In a case of ulcer of the tongue of twenty years' standing, the following treatment rapidly procured the healing of the sore. Its syphilitic origin was questionable. Four minims of Fowler's solution of arsenic were taken three times a day, and a mercurial bath twice a week, the ulcer being touched daily with nitrate of copper. After twenty-five days, Donovan's solution of arsenic iodine and mercury was given in doses of twenty minims twice a day. The ulcer rapidly healed. (Dr. A. Leared, p. 261.)

Flatulence.—*Charcoal.*—Charcoal when introduced into the stomach in a dry and fresh state has the property of absorbing gases. It may be given freshly prepared and hermetically sealed in gelatine capsules. Three or four capsules are generally sufficient to give complete relief in cases of flatulence. The best charcoal for this purpose is made from vegetable ivory, and must not be finely powdered. It has been shown by direct experiment that twenty grains, or two capsules of the vegetable ivory charcoal, absorbs two-and-a-half cubic inches of carbonic acid gas. (Dr. A. Leared, p. 107.

Hemorrhoids.—An ointment of persulphate of iron (℥ss.—℥j. ad oz.) in hemorrhoids is an excellent application when they are ulcerated, or when the constitution is weakened by diarrhœa or excessive fatigue. (Assistant-Surgeon Cartwright, p. 203.)

Internal Hemorrhoids.—Clamp versus Ligature.—The danger of pyæmia from the use of the ligature for the removal of hemorrhoids has been very much overrated, and other means, such as the clamp, proposed instead. There is, however, no plan more effectual or safer than the use of the ligature. Sir Benj. Brodie only saw two deaths out of 300 operations. Mr. Syme has never met with a case which terminated fatally, or threatened to do so, when the ligature simply was employed. The operation by the clamp is undoubtedly an effectual method of removing the disease, but it is in many respects inferior to that by the ligature. It is unnecessary to ligature the whole tumour, for the vessels which supply it always descend from above, just beneath the mucous membrane; the lower three-fourths may therefore be divided from the base by scissors, and the remaining fourth ligatured. When the ligatures have been tied the bulk of the tumours may be cut away. (Mr. J. R. Lane, p. 193.)

Inguinal Hernia.—*Radical Cure of.*—The success of an operation for the radical cure of inguinal hernia does no depend so much on retention of the invaginated scrotum within the canal, as on the formation there of a quantity of exudation and cicatrix tissue. Success frequently results when the invagination has completely descended, provided the patient has not by any premature over-exertion forced down the protrusion whilst the process of cicatrisation is yet incomplete. (Dr. J. Fayrer, p. 187.)

Polypoid Growths in the Rectum, with Fissure.—Occasionally polypus of the rectum is associated with anal fissure, the latter being a consequence of the former. A free incision must be made through the fissure, the polypus drawn down by a vulsellum, and a ligature applied at its point of attachment. It must then be cut off just beyond the ligature. (Mr. J. R. Lane, p. 200.)

AFFECTIONS OF THE URINARY ORGANS.

Lithotomy.—That free division of the prostate which implies a division of the reflected portion of the pelvic fascia. This should always be left untouched, for stones of great magnitude may be removed without such free use of the knife. This is one of the principal secrets of success. (Prof. Fergusson, p. 210.)

Infiltration of urine is the bugbear of modern lithotomists. I have never seen a genuine case of it. Diffuse inflammation of cellular tissue arising from some unhealthy state

of the constitution is often confounded with infiltration. (Prof. Fergusson, p. 210.)

LITHOTRITY *versus* LITHOTOMY.—Lithotomy should be preferred in patients below the age of 15, as being more successful than lithotrity. Could blades be brought against small stones, so as effectually to crush them to sand, this operation might after all be found to be one more generally applicable in children than it is usually deemed. In the female any other operation than lithotrity should be an exception to the rule. In adult males lithotrity should be considered the rule, and lithotomy the exception. It is in many cases desirable to dilate the urethra with bougies before crushing, and their use is often advisable to relieve irritability. (Prof. Fergusson, p. 203.)

AFFECTIONS OF BONES, JOINTS, ETC.

ACUPRESSURE.—An effectual way of closing an artery, and one quicker than all other methods is that by entering the point of the needle on one side of the artery, and pushing it behind the vessel until it emerges on the opposite side. The needle must then be twisted over the artery, and fixed on the parts beyond. In this method the artery is, to a certain degree both twisted and compressed. (Prof. W. Pirrie, p. 159.)

Acupressure is not only easy of application, but its adaptation to situations and circumstances is as great or even greater than that of the ligature. It may be employed in the instance of vessels as large as the posterior tibials. There can be no question as to its favouring primary union. (Dr. P. H. Watson, p. 171.)

Acupressure in Amputation at the Knee.—The popliteal artery may be effectually closed in cases of amputation at the knee by Simpson's third method of acupressure, that is, inserting the needle under the vessel and then putting a loop of wire across it, and turning it under the needle. (Prof. Macnamara, p. 180.)

AMPUTATION *of the Upper Arm.*—Amputation near the middle of the arm is often done, when a more conservative process would suffice. The covering of the end of the humerus may be taken from the forearm, where there is abundant material for a flap. (Prof. Fergusson, p. 141.)

Amputation of the Thigh.—It is better in amputation of the thigh to depend on compression of the main artery by the finger of an assistant than to trust to a tourniquet. Before commencing the operation the limb should be raised for a

short time so as to unload the vessels. It is a good plan to combine the advantages of the circular and of the flap operations, transfixing the limb as in the flap operation, but dividing the tissues adherent to the bone as in the circular, while retraction is made by an assistant. (Prof. Fergusson, p. 145.)

Amputation of the Thigh and Leg.—It is unwise to leave a thick muscular flap. This is the general result of transfixing and cutting outwards. I am by no means convinced that this is invariably the best method of performing the flap operation, and I feel assured that cutting from without inwards is in many instances followed by the best results. (Prof. Fergusson, p. 140.)

Amputation at the Knee-Joint.—An admirable stump may be made in some instances, by reserving the condyles and cartilages untouched, and covering them with a flap of skin merely from the front of the leg. (Prof. Fergusson, p. 143.)

Amputation at the Knee-Joint by Single Flap.—The operation consists in reflecting a rounded or semi-oval flap of skin and fat from the front of the joint; dividing every thing else straight down to the bone, and sawing the bone slightly above the plane of the muscles, thus forming a flat-faced stump with a bonnet of integument over it. There is less danger in this than in amputation at the lower third of the thigh, and the stump resulting is broader and more fitted to bear the weight of the body. The cicatrix is quite out of the reach of pressure. (Mr. H. D. Carden, p. 134.)

Cancerous Tumours of Long Bones.—Tumours of the lower jaw are often successfully removed by vertical section, both ends of the bone being left. The disease seldom or never returns if the section is made in the healthy part. This plan is, however, totally lost sight of when a tibia, fibula, or other long bone is affected with tumour, and nothing short of total ablation will satisfy. (Prof. Fergusson, p. 149.)

Capital Operations.—*Subcutaneous Injection of Morphia.*—It is a good plan in the majority of cases of amputations, ovariotomy, herniotomy, and other capital operations, to inject from a third to half a grain of morphia subcutaneously immediately after the operation. (Mr. H. W. Freeman, p. 80.)

Fractures.—Put the patient under chloroform, and ascertain by careful examination of the parts, whether an attempt should be made to save the limb, or amputation at once be performed. If amputation is not performed, and secondary symptoms come on and progress as they usually do to a great extent, there is little or no chance of recovery. After the

supervention of serious constitutional symptoms an operation is generally useless. (Dr. W. Lyon, p. 146.)

Fracture of the Skull.—Fracture of the skull from a blow by a stick is generally situated in the left parietal when the blow is given from before, owing to the weapon being held in the right hand of the assailant; and in the right parietal when when given from behind. The bone usually gives way where struck; fracture by *contre-coup* does not take place except from a fall. (Mr. B. W. Switzer, p. 158.)

Hemorrhage during Operations.—*Effect of Chloroform on the Amount of.*—There is more venous, but less arterial bleeding, when chloroform is used. The venous bleeding occurs as a general oozing when the tension of the muscles wears off. (Dr. Kidd, *Med. Mirror, Aug.* 1865, p. 458.)

Operations on the Jaw Bones.—In the removal of even the largest tumours, it is unnecessary that the incisions should be so extensive as to divide the lip, even when a portion of the bone is removed by vertical incision. When a ligature is used in this kind of operation, both ends of the vessel should be tied. The great secret of success is to entirely remove the diseased portions, clipping and gouging, when the operation is on the upper jaw, until healthy surfaces are reached. If it is necessary to divide the lip, the incision should be in the mesial line. (Prof. Fergusson, p. 147.)

Tumours of the Lower Jaw.—Horizontal sections of the lower jaw must always be preferred to vertical ones if practicable, in order that the shape of the lower side of the face may be preserved. (Prof. Fergusson, p. 150.)

Strumous Synovitis.—Cases of strumous synovitis in the torpid phase of the disease are as a rule ordered to remain at complete rest, with the limb on a splint for months, or even years. This, however, destroys the health of the patient, and the disease notwithstanding terminates in the destruction of the joint. As soon as all inflammation has completely ceased, the skin being white and cool, passive and then active movements along with friction must be employed in order to restore form and flexibility. (Mr. R. Barwell, p. 129.)

Test of Inflammation in Joints.—In every important joint there is some one spot peculiar to each, tenderness on pressure in which indicates the presence of latent inflammation. These are, for the knee, a small space over the inner trochanter and inside the patella; for the elbow, the posterior part of the junction between the radius and humerus; for the wrist, the union between the scaphoid and ulna; for the ankle a spot just outside the extensor longus tendon. For

the shoulder, this choice spot of tenderness is situated at the back and external aspect, where the posterior fibres of the deltoid cross the joint; at the hip, the test place is just behind the trochanter. (Mr. R. Barwell, p. 132.)

AFFECTIONS OF THE SKIN.

Acne.—There is only one medicine really necessary, and that is arsenic. All the others only clear the way for it. Sometimes it is necessary to give a mild saline aperient for a few days before beginning with the arsenic. In some cases it is well to combine liquor potassæ with the arsenic. Another remedy of great value is the biniodide of mercury in doses of the sixth of a grain or so daily. The best local applications are calomel ointment and the ointment of the hypochloride of sulphur. (Mr. J. L. Milton, p. 245.)

Alopecia.—Only two remedies can be relied upon, viz., the internal use of arsenic, and the external one of cantharides. A regular course of arsenic should be given. The cantharides must be so applied that a piece of skin the size of a shilling is blistered every second or third day until the whole of the surface is operated upon. (Mr. J. L. Milton, p. 222.)

Mr. Wilson uses an ointment made by macerating six drachms of the powdered cantharides, with a gentle heat for twenty-four hours, in three ounces of pure lard, it is then strained through blotting paper. (p. 221.)

Carbuncle—*Subcutaneous Section.*—The following plan of treating carbuncle has been pursued with great success for many years by Mr. French, surgeon to the St. James's Infirmary. Let a tenotomy knife be introduced through the healthy skin a little beyond the edge of the induration, the forefinger of the left hand serving as a guide upon the surface of the tumour. Let it be divided subcutaneously with a crucial incision, the skin being left uninjured. Immediate relief is obtained, and the rapidity of the recovery which follows is very striking. The knife may be entered several times if the carbuncle is very large. (Mr. C. Heath, p. 260.)

Eczema.—Eczema is not a vesicular disease at all. Let the surgeon examine carefully for himself, and he will fail at any period of the disease to find true vesicles. (Mr. J. L. Milton, p. 226.)

Antiphlogistic treatment must always be avoided in eczema, as the disease never occurs without a certain feebleness of health. Every chronic case is benefitted by cod-liver oil, if given long enough, and in doses not larger than the stomach

can bear comfortably. On arsenic alone no reliance can be placed at any stage except the last, and not always then. It is chiefly useful when the skin is red and tender with a quick reproduction of unhealthy cuticle or scabs, great itching, and a strong tendency in the disorder to stand still. The most useful remedy against the eczema of middle or advanced age is steel. One or two drachms of steel wine given two or three times daily will remove most cases of eczema in children. The saccharine carbonate is also a good preparation. In adults the tincture of the muriate of iron is the proper remedy. It is essential, however, that no free acid be present in the preparation used. It must be given with occasional intermissions for two or three months at least. (Mr. J. L. Milton, p. 228.)

Few, if any, cases of eczema will in the long run resist the influence of iron. Cod-liver oil must be given at the same time. If after a full trial of these the case is not cured, cod-liver oil and arsenic should be given, and these failing, the biniodide of mercury should be given. (Mr. J. L. Milton, p. 229.)

Ill-Smelling Feet.—Shoes which have induced the excessive and ill-smelling secretion must be left off, and great cleanliness observed. If this simple means fail, completely envelope the feet in linen upon which an ointment composed of diachylon and linseed oil has been spread. Then cover the foot with a stocking and light shoe; every twelve hours the application is to be renewed the foot being at the same time well rubbed with a dry towel. In about ten days, friction by means of some simple powder, such as common flour must be employed and the ordinary shoes worn. After some days, brownish-yellow portions of epidermis will separate, leaving a white, clean, healthy epidermis behind. For some time afterwards the flour should still be rubbed into the foot. At the end of two or three weeks the foot-sweating either disappears for ever, or, at least, for one or more years. (Prof. Hebra, p. 263.)

Itching of Skin, in various complaints.—Apply a lotion of bichloride of mercury, ex. g., hydr. bichlor. gr. i.; aquæ destill. ℥v.; alcohol ℥ij. ft. lotio.; apply this three times a-day. The quantity may be increased or diminished according to the effect. (Dr. Martin, p. 220.)

Prurigo.—In obstinate cases and in the prurigo of old people, the following treatment gives good results. Let strychnia be given in doses of the sixtieth of a grain in solution every three or four hours, till a decided effect is produced upon the disease, or till nervous symptoms show themselves, when it

may be left off; a vigorous course of arsenic should follow it. To relieve the intolerable itching the skin should be frequently rubbed with a damp sponge dipped in fine oatmeal, after this the tincture of croton (made by steeping an ounce of bruised croton seeds for a week in four ounces of spirit) should be applied, and after this has been done a few times, a lotion of bichloride of mercury in almond emulsion, fifteen or twenty grains to a pint, will often complete the cure. The application of iodine or of glycerine is sometimes of use. For the affection of the pudendum, Bateman recommends a lotion made of two grains of bichloride of mercury, and one ounce of lime water. Injections of very hot water, juniper-tar ointment, blisters to the thighs, and small bleedings, are upon the whole the most reliable remedies. (Mr. J. L. Milton, p. 227.)

Psoriasis.—Arsenic in the treatment of psoriasis would be found much more servicable if its administration were continued steadily for months. Next in efficacy to arsenic in the internal treatment of psoriasis comes cod-liver oil. Its use is especially indicated when there are any indications of struma. Alkalies should be given when there is a gouty or rheumatic taint, or, when there is a tendency to acidity of the stomach, and to the deposit of lithates in the urine; no alkaline preparation is more suitable than liquor potassæ, taken in a large quantity of water, in doses of twenty drops thrice daily. In chronic cases local treatment is required, the scales must be removed by means of warm baths and thorough rubbing with towels after each. Preparations of tar are the most generally useful. To the head and face, however, these are inapplicable, and a solution of soft-soap and water is preferable. (Dr. M'Call Anderson, p. 238.)

Solution of Venice Turpentine as a Dressing for Wounds.—Apply over the whole surface of the wound a compress consisting of several folds of linen, well soaked in the following dressing: Venice turpentine 2 ℔ 8 oz., troy; bicarbonate of soda, 6½ drachms; water, 18 pints imperial. This is to digest in a bath for six days, at a temperature not higher than 75° C., and then filter. The compress should be moistened by means of a sponge with some of the solution every four or five hours. Cicatrization of even very large wounds under this treatment is wonderfully rapid, the secretion of pus being very slight, while there is an entire absence of fœtidity. (M. Kerner, p. 262.)

Tinea.—*Diagnosis of.*—Tinea may be recognised without the use of the microscope. First we may eliminate all diseases which really begin with pustules, and refer them to impetigo, which is not a contagious disease at all. Vesicular diseases

do not occur. True eczema is a weeping of the surface followed by crusts. Thus there only remains the true tinea, dry, scurfy, reddened patches, accompanied by clipping, shedding, twisting and loosening of the hair, and a secretion of scales, which in favus may even assume the form of crusts. (Mr. J. L. Milton, p. 223.)

SYPHILITIC AFFECTIONS.

SYPHILIZATION.—Immunity from variola is obtained by one single inoculation, whereas immunity from the syphilitic virus is only obtained by a long series of inoculations. But when the cure is effected it is permanent, whereas nothing can be more melancholy than the results of the mercurial treatment. The employment of syphilization as a prophylactic would be immoral; but as a curative agent, where the disease is already constitutional, this accusation cannot be made. The virus must be taken from an indurated chancre and inoculated on both sides of the chest; after three days pustules are developed, and from these fresh inoculations must be made at a distance from the first. At the end of every three days, the process must be repeated, so long as the matter continues to afford a positive result. When this is no longer the case, fresh matter must be procured and inoculation proceeded with as at the first. When this no longer akes, a third must be procured and inoculated on the upper arms, and then on the thighs. This treatment is radically curative of syphilis being followed by only 12 or 13 per cent. of relapses, and these are so mild as only to require two or three days' treatment. Children should be treated precisely the same as adults; but the results have not been so successful as they have amongst adults. (Prof. Boeck, p. 304.)

Sometimes it is difficult to procure an inoculable secretion from an indurated sore. By constantly applying some savine powder to the surface of the sore, an inoculable secretion is produced. (Mr. Henry Lee, *Lancet*, *July* 8, 1865, *p.* 40.)

AFFECTIONS OF THE EYE.

CATARACT.—There is no notable difference between the results of the upward and downward section, if equally well performed; but the downward operation is generally carried out more perfectly in consequence of the greater rapidity and facility with which it may be executed. The operation for cataract should be performed in bed, in order that the patient may have the advantage of being in a position of the most

complete muscular repose, and of being able to remain in the same position after the operation. The operation being on the right eye, the surgeon must sit behind the head of the bed. Immediately after the operation the compress bandage must be applied. The orbit should be equally padded with picked lint, in little discs, over which a simple ascending turn of a flannel bandage is moderately tightly drawn across the eye. In a case which is running a favourable course it is unnecessary to open the lids until four or five days after the operation. (Dr. Von Graefe, p. 277.)

Removal of Cataract by the Scoop Method, or by Traction.—The present mode of extracting a cataract by the flap operation is attended by a considerable percentage of failures. A safer operation is the following, the principle of which is to make a wound of such a size and shape as would permit the transit of the cataract, but not without the use of an instrument to draw it through the opening. Having given chloroform and opened the lids fully with a wire speculum, fix the eye by means of a strong pair of forceps. Then, by means of a spear-headed knife curved at an angle on the flat, make an incision through the substance of the cornea, about half a line from its junction with the sclerotic. This may be either at the upper or outer part of the cornea. Next remove a small portion of iris by means of forceps bent at an angle, and with fine Asselini points. The object of this is to facilitate the exit of the cataract, to prevent the possibility of prolapse, and to diminish the liability to iritis and closed pupil. The capsule must now be opened freely in the same way, and with the same instrument as in an ordinary flap extraction. A thin, flat, and concave scoop must now be passed to the posterior surface of the lens, and then withdrawn, bringing with it the lens, or such nucleus portion of it, as is of sufficient density to escape entire. Every particle of opaque lenticular matter must be carefully removed by means of a suitable spoon. The after treatment consists in the application of cotton wool soaked in cold water to the surface of the eyelid, and in the use of atropine in order to keep the pupil well dilated. (Mr. G. Critchett, p. 280.)

Catarrhal Ophthalmia.—More frequently than otherwise local applications, such as nitrate of silver and sulphate of zinc, prolong the complaint and cause granulation of the lids. All depleting remedies must be avoided: the treatment should be entirely restricted to constitutional remedies of a tonic character, merely directing the eyes to be frequently fomented with warm water, as much for the purpose of cleanliness as for comfort. If there is much intolerance of

light or lacrymation, Dover's powder should be given in small doses. In ordinary cases bark and ammonia are the most suitable remedies. (Mr. H. Hancock, p. 265.)

Fundus Oculi.—*To Examine without the Ophthalmoscope.*—Place a lamp on a table in a darkened room, place yourself between the lamp and the patient, letting the lamp shine into the eye over your right shoulder (previously dilating the pupil with atropine). With a lens of about two inches focus you may see the interior of the eye very well. (Dr. Roseburgh, p. 277.)

Improved Eye Speculum.—The ordinary wire forceps sometimes allow the lids to overlap, and so interfere seriously with the progress of any operation. The parts of the instrument directly employed in separating the lids should be grooves of metal, troughs in fact. These should be curved, and the length of the ordinary eyelid. This speculum may be obtained from Messrs. Weiss, London. (Mr. J. Z. Lawrence, p. 276.)

Paralysis of the Ocular Muscles.—*Electricity.*—When electricity is applied for the cure of paralysis of the ocular muscles, a beneficial action is only produced when the excitation is relatively weak. All improvement ceases if the current is applied too strong, or for too long a time. Half a minute at a time is quite sufficient. The cure is dependent, generally speaking, upon reflex excitation through the fifth pair of nerves, and not upon direct excitation of the nerves supplying the muscles themselves. Hence, the proper measure for the strength of the current is always measured by the sensitiveness of the fifth pair. When improvement occurs it is generally instantaneous, so that if none takes place in a fortnight it is not worth continuing the trial longer. (Dr. Benedikt, p. 301.)

Phlyctenular Corneitis.—*Yellow Oxide of Mercury.*—Ointments containing red oxide of mercury are favourite remedies especially in various forms of blepharitis. But they have one great disadvantage, they are liable to irritate too much, owing to the crystalline form of the red oxide which cannot readily be sufficiently pulverised. The amorphous or yellow oxide, prepared by precipitation, is indubitably preferable to the red. One drachm of the yellow oxide in each ounce of ointment is about the proper strength. The good effect of this ointment is most seen in the more chronic cases, where congestion is only passive. It should be applied only once a day, with a small brush, which is dipped in the ointment and applied between the eyelids; these, by their closure, rub off the ointment from the brush. It should not be left long in the eye, but when it has become well diffused over the eye

wipe off as much as possible with a piece of linen. (Dr. Pagenstecher, p. 267.)

Vascular Cornea and Granular Lids.—*Purulent Inoculation.*—The more vascular the cornea the greater the probability that no sloughing will follow the treatment by purulent inoculation, and *vice versa.* In several cases, it is a good plan to perform circumcision of the conjunctiva, and then to inoculate a few weeks afterwards. A broad belt of conjunctiva should be removed around each cornea, care being taken to clear away every trace of tissue down to the sclerotic. (Mr. J. Hutchinson, p. 275.)

MIDWIFERY, AND THE DISEASES OF WOMEN AND CHILDREN.

Abortion.—When the general symptoms, such as a shrunk condition of the papillæ of the breasts, a watery uterine discharge, and extreme lassitude, indicate the death of the early fœtus, it is better to give ergot at once; if this fail, the introduction of sponge-tents will be sure to produce expulsion. (Dr. C. Bell, p. 329.)

Deformed Pelvis.—*Induction of Premature Labour.*—An interesting case of induction of premature labour is related at p. 327. The os was gradually dilated by means of the india-rubber bags, and the attempt to extract by means of the forceps proving a failure, the child was turned. The pelvis however was so contracted that it was found impossible to extract the head: so as the funis had ceased to beat the occipital bone was perforated, and the head (occiput looking directly backwards) extracted by the craniotomy forceps. (Dr. G. Hewitt, p. 327.)

Dysmenorrhœa.—In bad cases of dysmenorrhœa there is frequently retention of the fluid of the uterus, owing to mechanical obstruction at the junction of the cervix with the body of the uterus. Where the cervix is hard and dense, cutting operations are most indicated, but under other circumstances the use of tents is preferable. (Dr. Graily Hewitt, p. 363.)

A good instrument for incising the contracted os is like a scissors with the cutting edges directed outwards. When closed the blades overlap each other, and thus the cutting edge of each is protected by the back of the other. The incision of course is made as the instrument is withdrawn. To prevent union, roll a thin piece of sheet lead round the points of an ordinary dressing forceps, and pass it into the wound, when by opening the blades of the forceps the lead is expanded and it is thus left in the wound, the forceps being

withdrawn. A piece of cotton wool must be placed in the upper part of the vagina, so as to keep the lead in its place and to control bleeding. (Dr. Kidd, p. 358.)

ERGOT.—*Active Constituents.*—Two vegetable nitrogenised alkaloids may be isolated from ergot of rye. Half a grain of "ecbolina" produces the same effect as half a drachm of the ergot; it induces a specific action on the spinal column and muscular system, which leaves behind a great amount of debility. The other alkaloid "ergotina" is of no medicinal value. (Mr. Wenzell, p. 324.)

FACILITATION OF THE FIRST STAGE OF LABOUR.—Separation of the membranes for some distance round the os favours dilatation much more efficiently than any means hitherto employed. Relaxation of the os will very generally result from this procedure in cases of prolonged first stage from rigidity. This separation may generally be effected by the finger; if this is not practicable however Dr. Hamilton's uterine bolt may be used. (Dr. A. Inglis, p. 318.)

FLACCID UNCONTRACTED UTERUS.—*Electro-Magnetism* —Apply one pole of an electro-magnetic machine inside the uterine cavity, whilst the other is applied externally over the abdominal walls. By this plan contraction was produced in a case which had resisted all other means. (Mr. D. W. Parsons, p. 336.)

HYSTEROTOMY.—All the good that can be gained by hysterotomy in the cure of uterine flexions, and of obstructive dysmenorrhœa, and the sterility which is so often associated with these conditions, is certainly gained by an incision which only passes through the mucous membrane and the innermost layer of muscular fibres. It is dangerous to cut into the thicker middle layer of muscular fibres, containing as it does large vessels, especially veins, and *a fortiori* into the outer layer which is so intimately connected with the peritoneum. (Mr. T. S. Wells, p. 337.)

INCISION OF THE OS UTERI.—There are many cases of conical cervix uteri, the os externum being so minute as scarcely to admit the uterine sound. The os internum in these cases is usually of normal calibre. Division of the os externum relieves these cases, which are characterised by dysmenorrhœa, metrorrhagia, and sterility. (Dr. Barnes, p. 360.)

LACERATED PERINEUM.—The surface of the wound must be clean and regular in the operation for the cure of lacerated perineum, otherwise primary union of the two surfaces will not take place. It is well that the wire sutures should be inserted at least half an inch, or better still, an inch from the margin

of the wound, and brought out at its posterior border close to the vaginal mucous membrane; it should then be reintroduced at a corresponding point on the opposite side, and brought out at a spot similarly situated into the one at which it was introduced. When the recto-vaginal septum is introduced or sphincter ani has been lacerated, the posterior suture should be made to pass through the thickness of the recto-vaginal septum. (Mr. T. Bryant, p. 368.)

Complete Rupture of the Perineum.—When the plastic operation is performed for the cure of complete rupture of the perineum, very great care and attention are required to retain the parts in accurate contact, because the action of the sphincter muscle is continually tending towards the separation of the edges of the wound at the lower angle. For this reason it is very desirable to paralyse the action of the sphincter for the time, by an incision. It is, however, sufficient to divide it on one instead of both sides as is usually done. (Mr. J. R. Lane, p. 370.)

Painful Menstruation. — The severe operative measures which have been recently recommended in the cases of painful menstruation are in most cases unnecessary. The cavity of the cervix is scarcely ever contracted without severe disease, and any contraction, if such really exists is generally at the sphincter of the os internum, and may be remedied by a division of the tissue to the depth of a line on either side. It must be remembered, however, that this sphincter muscle, even in the healthiest females, is rarely passed by a bougie without some little resistance. Menstruation may be painful from its dawn to its close without any mischief or impediment existing of any kind whatever. Gradual dilatation by means of sponge-tents is far more permanent in its results than division with cutting instruments. The tents, however, must be very short, so as not to reach the uterine cavity, and must never be introduced without the absence of any inflammatory state is first ascertained by means of the speculum. Metal dilators are injurious, they do not dilate but crush the tissues. (Dr. J. H. Bennet, p. 364.)

Placenta Prævia.—When the os is undilated and rigid, separation of a zone of placenta by the finger will not only check hemorrhage, but produce relaxation. (Dr. Trask, p. 323.)

Procidentia Uteri.—Remove the mucous membrane from the base of the bladder in two broad bands, extending from a point a little behind the urethra to each side of the cervix. The scarified surfaces must then be connected just in front of the cervix uteri for the purpose of closing the pouch, and

thus forming a firm unyielding support. This is to be effected by means of silver sutures. In order to keep the prolapsed uterus in the proper mesial line, and so obviate the difficulty of keeping the proper line for scarification, bend the end of a flexible plated copper sound in a circle sufficiently large to slip over the neck as a collar, and let an assistant with this firmly depress the prolapsed base. The mucous membrane may be removed by means of curved scissors. (Dr. T. A. Emmet, p. 374.)

Puerperal Fever.—The principal object to be sought in order to prevent that form of puerperal fever not dependent on contagion by the medical attendant or the nurse, must be firm contraction of the uterus after labour. Pressure by the hand, and the passage of lumps of ice up to the uterus per vaginam, are the only means which can be relied upon for this purpose. The administration of ergot is, however, a useful addition, and may be given as a rule in almost every case of labour, after the birth of the child, with the object of ensuring the firm contraction of the uterus. It may be combined, in powder, with tincture of Indian hemp and borax, and some stimulant and aromatic. If noxious fluids are present in the uterus, at any period subsequent to the labour, and are threatening by their absorption to produce fever, the uterine cavity should be washed out with a weak solution of the sulphites or hyposulphites in tepid water. (Dr. Snow Beck, p. 339.)

Puerperal Convulsions.—Chloroform.—In an interesting case of severe puerperal convulsions attended with opisthotonos and and symptoms resembling those produced by strychnine, the use of chloroform produced marked alleviations of the symptoms. The inhalation was kept up for three hours, and the patient ultimately recovered. (Dr. J. Cuthill, p. 348.)

Removal of the Placenta.—When the child is born, the hand must follow the descending womb, and grasp it, so gently as not to cause pain, and yet with a moderate firmness. This pressure ought to be relaxed as little as possible during the separation of the child. The placenta will now usually be found partially extruded, and a short continuance of the pressure will effect complete expulsion. (Dr. Paterson, p. 333.)

Tedious Labour.—*Ergot.*—When we desire to produce pains exactly like the natural labour pains, that is not so severe as to be continuous, we ought not to employ the large doses of ergot usually given. Five grains given every quarter of an hour will produce all effects desired. (Dr. D. Dyce Brown, p. 324.)

Vesico-Vaginal and Recto-Vaginal Fistulæ.—In the operation for the cure of vesico-vaginal fistula, the principal element of success is the absence of irregularity or raggedness of the wound's surface. If any such irregularity exists primary adhesion of the edges cannot take place. To render the paring of the edges more certain and satisfactory, Mr. Bryant, of Guy's Hospital, has invented an instrument to transfix and steady the part, whilst at the same time it acts as a guide to the knife. The instrument consists of a handle, to which are adaptable six guides, three for transverse and three for vertical fistulæ. In each of these two sets there is one with three prongs, one with two, and one with only one prong. In the set for transverse fistulæ, these prongs are in the same line as the handle, whilst in that for vertical fistulæ, they are at a right angle. In both sets the prongs are set in a bar, in the same manner as the prongs of a rake. These prongs should be inserted at the edge of, but not through the mucous membrane of the bladder, and passed *between* the tissues, and then brought out through the mucou membrane of the vagina. It is now easy with one sweep of the knife to remove the transfixed portion of tissue. The lower margin must then be treated in the same manner as the upper, and the raw surfaces be brought together by wire sutures. (Mr. T. Bryant, p. 371.)

CHOLERA.

Pathology and Treatment.—The poison of cholera acts through the blood chiefly on the ganglionic nervous system, at first probably rousing it up to violent action, but followed very rapidly by its paralysis. Thus, at first, we have spasm of the organic muscles of circulation, respiration, voice, of the intestinal canal, and many of the voluntary muscles. The consequence is, that the blood is sent into all the great central veins, and cannot get round to the left side of the heart, on account of the same spasm or contraction of the branches of the pulmonary artery. In short, the circulation is stopped or nearly so. Then follows the real collapse, when spasm relaxes, but it is the relaxation of death unless the vital power has energy enough to begin again. On the first attack of real Asiatic cholera, therefore, do not stimulate—do not interfere with either vomiting or purging*—but use the

* The premonitory purging of cholera may be cautiously treated in the way we treat English cholera, but if it prove to be the real Asiatic cholera we think that all astringents ought to be at once given up.

utmost diligence in giving *chloroform*, both by inhalation and internally. Teach the nurse how to do it, as you cannot be everywhere, and cannot be both doctor and nurse. Relax the cramps and spasm by chloroform; and, if necessary, carefully stimulate by ammonia or champagne, but *not until the spasm is overcome.* The circulation will then be resumed, and not be followed by the dangerous reaction, which formerly killed so many patients. But avoid all stimulants if you can, and let the reaction come slowly, and if you feel compelled to stimulate let it be by spt. am. co., champagne, or other mild wine. Give copious draughts of cold water, and even encourage vomiting. Give copious saline effervescing draughts, if agreeable.

Do not give opium at all, let the purging alone. It is supposed that it does more good than harm by *eliminating* the poison, and some even increase the purging by giving castor oil. Encourage vomiting by large quantities of cold water, with a little mustard in it if necessary. The muscles of vomiting are so energetic that the water will often be ejected with violence, but keep repeating the cold water, which is always greedily swallowed. There seems to be no specific power in calomel or any other medicine. Apply external cold or warmth as may be most agreeable. The best way to apply warmth is to wrap the patient up in a blanket wrung out of hot water, and over this hot-wet blanket place three or four other blankets. The hot blanket can at any time be renewed, and if you like you can, during its renewal, wipe the body over with a towel or sponge wrung out of *cold* water. The skin will be powerfully stimulated by this treatment to draw the blood back from the central veins, as soon as the contraction of the pulmonary capillaries will allow the blood to get round to the left side of the heart. Another method is to place the patient in a hot hip-bath with his feet in a foot-bath, the hot water to have about a pound of flour of mustard in it, and to be kept hot by adding hot water as required till reaction sets in, and the cramps and spasm relax. We have said nothing about bleeding, because, although we think that the practice was correct as laid down by the several writers mentioned, yet we have in chloroform and other anti-spasmodics all the good effects of bleeding without the danger. And as to stimulants they are generally injurious: a combination of compound spirit of ammonia with chloric ether, is one of the safest and best stimulants we possess, and champagne and other sparkling wines are now so cheap and good that we should recommend them before all others. (Dr. Braithwaite, p. 385.)

PRACTICAL MEDICINE.

DISEASES AFFECTING THE SYSTEM GENERALLY.

1.—TREATMENT OF ZYMOTIC DISEASES BY THE ALKALINE SULPHITES.

By Dr. De 'Ricci, Dublin.

[The arrest of zymotic diseases is at the present moment a most interesting question. How many diseases which attack us are owing to some mysterious fermentation of poisonous materials in the blood we are ignorant of! but we suspect that this is a more fertile source of disease than we have hitherto supposed. If we could stay all forms of catalytic action in the system we might arrest some of our most fatal diseases. We therefore direct particular attention to the two following papers by Dr. De 'Ricci and Dr. Purdon.]

That sulphurous acid had the power of checking fermentation, was a chemical fact that had been known for many years, and in wine-making countries had from time immemorial been employed to stop vinous fermentation when it had reached the required point; but that sulphurous acid possessed the power of stopping other catalytic action besides vinous fermentation, was not so well known, and the great fact that the alkaline and earthy sulphites possessed, in common with the acid, this same important quality was altogether unknown, until discovered and proved by Professor Polli of Milan, to whom the entire merit of the discovery is due. When the humoral theory of disease was in a way revived, and when the truth of a zymotic or catalytic origin of many diseases was all but universally admitted, I presume it occurred to many others besides Professor Polli and myself, that if a subtance could be discovered which could neutralize the zymotic principle—the ferment—without, at the same time, being injurious to life, a remedy would have been discovered for all zymotic diseases, and as this class comprehends almost, if not all, the most fatal diseases to which man is liable, the value of such a discovery would have been incalculable. I believe that in the alkaline sulphites we possess such a remedy, and to my friend Professor Polli is due the whole merit of the discovery. How the idea of employing sulphites instead of sulphurous acid, which cannot be administered, never occurred previously cannot be well explained,

although, Claude Bernard's assertion that it was impossible to neutralize zymotic principles in the living frame without at the same time destroying its vitality, may have contributed somewhat to deter physiologists from trying experiments in that direction.*

Zymotic diseases are supposed to arise and to be propagated by a specific poison, which has the property of reproducing itself. A striking example of a zymotic disease we possess in small-pox; if a fraction of a drop of variolous infection is introduced into the circulation of an individual not proof against such infection, that fraction of a drop will in the course of a few days multiply itself millions of times. This increase is supposed to be the result of an action resembling fermentation; and though this fermentation be somewhat different from that which operates in a brewer's vat, it is yet very analogous to it, and as it turns out, is subject in many instances to the same laws. It had been known for centuries that fermentation cannot continue in the presence of sulphurous acid; but it is a discovery of the last few years that the sulphites possess the same properties as the acid itself, and this fact has been established in many ways. Two animals of equal kind, size, and condition, were fed alike for a few days, with the exception that to *one* of them was administered a certain amount of a sulphite, until the urine passed off gave evident proof of the presence of the salt in the circulation. Both animals were then killed and exposed to the same conditions of heat, moisture, &c., &c. It being summer when these experiments were carried out, and the weather being warm, putrefactive fermentation very soon set in, but only in the animal to whom no sulphites had been administered; the *sulphurized* animal (if I may be permitted to coin a new name), on the contrary, still remaining fresh for many days after the other one had long passed into an advanced stage of decomposition. Other animals, after having been saturated with sulphites, were killed, and every portion of their body, solids and fluids, gave on examination unquestionable proofs of the presence of the sulphites employed. These experiments seemed to prove that when the sulphites, whether alkaline or earthly matters not, are introduced into the stomach of a living animal, they may be absorbed and circulated *as such* throughout the organism. This fact now established, the following deduction was unavoidable —that as no fermentation can take place in the presence of a

*Claude Bernard says, "Fermentation may arise in the blood, and give rise to poisonous principles, which may, in their turn, produce certain grave accidents in the living frame. . . . We cannot neutralize these ferments in the living organism *it is impossible*: because to effect such a purpose it would be necessary to interfere with the character of the blood to such a degree that it would no longer be capable of sustaining life."

sulphite, and as sulphites can be administered with impunity to living animals, and are absorbed *as sulphites* into the circulation, in a disease depending on a fermenting or zymotic action, we could arrest such action by saturating the system with one of these sulphites. Thus far this matter had been reasoned out well and satisfactorily, but facts were required to establish it, and to obtain these the following experiments were instituted :—Two dogs of same size and weight, and in good health, were fed perfectly alike for four or five days, excepting that to one was administered daily a certain quantity of bisulphite of soda. Having been thus prepared, some very fetid pus (about one drachm) obtained from an ill-conditioned abscess was then injected with great care into the femoral veins of each dog, and the results watched; immediately after the operation both dogs seemed stupefied; they lay down, refused all food, and remained prostrated for twenty-four hours. Both, however, seemed a good deal better on the following day, when a fresh injection of the same pus and to the same amount was again practised, both dogs being still fed alike, with the exception of the one to whom bisulphite of soda still continued to be administered in full doses. The effect of the second injection was most interesting. Both dogs were affected alike; both were seized with stupor; in both the pulse was rapid and feeble, while the respiration was greatly accelerated. Both dogs refused their food; both lay down in a state of stupor, and when made to rise and walk, tottered and reeled across the room. One dog, however, continued to receive daily a certain amount of sulphite of soda, and in four days was so far recovered as to be able to eat again his food with relish, while the wound in his femoral vein was healing rapidly. The other dog fared differently; he was fed equally, but he got no sulphites either before or after the operation, and the result was that he daily became worse; the wound in the thigh became gangrenous; the limb swelled up, and, ten days after the second injection, the dog died with all the symptoms of typhus, the other dog being about and well. Upwards of three hundred dogs have been experimented on by Professor Polli and myself in this manner. We have varied the infecting substances by employing pus of different kinds—sanious matter, from ill-conditioned phagedenic and sloughing sores; we have employed defibrinated blood that had purposely been exposed for months to the air and become putrid; we have employed the discharge from the nares of glandered horses—and we have always obtained the same result. I do not mean by this to assert that in every case the sulphurized animal has recovered, while the other has perished; but in the great majority of cases those animals to whom the sulphites had been freely and largely administered

did well, while the corresponding animal in almost every experiment perished. These are facts which any one can try for himself; and now, what has been the result of these facts when applied to the treatment of disease in the human subject? Just one year ago I published the details of a most interesting case of septicæmia treated solely and entirely with bisulphite of soda, where death seemed to be imminent and the patient given over, and where the infection had clearly resulted from repeatedly kissing, for several days in succession, the dead body of a beloved friend far advanced in a state of decomposition. My friend Dr. B. M'Dowall, professor of anatomy in our university, has on several occasions tested the value of these sulphites in the treatment of scarlatina and small-pox, and always with satisfactory results.

My friend Dr. William Waters, of Carbury, treats all his cases of scarlatina with bisulphite of soda or magnesia, and not only administers it during the disease, but also as a prophylactic, with the greatest success, and last year fully established the safety of the remedy by administering it as a prophylactic to an infant three months old. Scarlatina of a very malignant type had broken out in the family of a gentleman in his neighbourhood; the eldest boy died of it in three days. Dr. Waters administered the sulphites to all the inmates of the house, including the infant. Some of the family escaped the disease altogether, and those who did take it had it in the mildest possible form. The first case in which Dr. M'Dowall tried this remedy was a most unfair one, it might be thought, but fortunately it turned out successfully. It was a case of confluent small-pox, which from collateral symptoms seemed to offer little if any hope of recovery; it was a case, in fact, in which nothing could be done, according to previous ideas. Sulphite of soda was prescribed in scruple doses every third hour, and to the surprise of the doctor and the whole class, the patient not only recovered, but recovered without a scar. Dr. Cummins, of Cork, has published in the 'Dublin Quarterly Journal,' vol. 77, a very interesting paper on the treatment of scarlatina by alkaline sulphites which he employed also as a prophylactic, and always with decided success.

I might add a great deal more, and cite cases of the most rebellious fevers treated at Tunis and other parts of the northern coast of Africa—fevers which, for intensity and malignancy, were scarcely if at all inferior to the Egyptian plague. These fevers have of late been all treated with bisulphite of soda and magnesia, and the success has been so great, the recoveries so marked, that the present sovereign of Tunis has publicly recognized Professor Polli's discovery by a handsome present and the decoration of an order of merit.

I might tell of the great success which has attended the local application of the sulphites in solution to putrid and phagedenic ulcerations, but shall content myself with quoting a short but most important letter which I received last spring from Dr. J. H. Purdon, of Belfast:—"Though personally a stranger, I cannot refrain from doing that which I am sure will give you pleasure, viz., informing you of the success of a remedy you have introduced to our notice, the bisulphite of soda. The cases in which it has been tried by us have all been puerperal, and in all, so far as I have been able to ascertain, it has proved successful. The first case I tried it in was with a primipara. The labour had been complicated with placenta prævia and consequent hemorrhage. On the third day she had rigors, which were quickly followed by rapid pulse, great prostration, profuse perspiration, fœtid diarrhœa, and facies hippocratica. Opium and mercury were freely tried, when, finding after five days that the patient was gradually sinking, I determined in consultation with my brother, whose patient she was, to administer the bisulphite of soda in scruple doses every four hours. From the third dose there was progressive amendment, all the bad symptoms subsiding. After a few more doses the lochia returned, and in a fortnight she was perfectly convalescent. The next case in which this remedy was tried was also a lady, but under the care of another physician justly in extensive practice. It had been a 'face to pubis' case, very tedious, and finally requiring the aid of forceps. On the third day symptoms of uterine disease set in, for which mercury, opium, and quinine were freely administered, and the gums became rapidly affected. Notwithstanding all this heroic treatment, matters had reached by the ninth day a most alarming height. The patient complained of but little pain, but she was greatly prostrated, and the pulse was 140, and very feeble. Bisulphite of soda was administered as in the previous case, together with opium and quinine, first every four hours and then every six hours. The following morning the pulse was at 130; in the evening of same day it had further come down to 106. The second morning it was at 96; the third morning 86. The bisulphite was persisted in all through, and the case ended in perfect recovery.

"A few weeks after I saw another patient, in whom the usual symptoms of puerperal fever of the typhoid type had set in on the fifth or sixth day. It was determined to lose no time with other remedies, but to administer the bisulphite at once in scruple doses every three hours. The pulse at this time was 140; by the next morning it had fallen to 120, when it steadily declined, and in a short week she was perfectly convalescent. Since these cases, my brother has had two more cases in the same locality as the first, in both of whom symptoms of the

same character showed themselves. In both the same remedy was adopted, and in both the same successful result was obtained. I have heard of other successful cases in this neighbourhood amongst my professional friends, but can give you no details. I may add, however, that my brother and I have used it successfully both in anthrax and boils, which latter are very continuous in our jail, and we have found it to succeed admirably in 'putting a stop' to their recurrence."

I now conclude. I think I can safely assert, in the first place, that I have proved this remedy, the bisulphite of soda, to be perfectly *harmless*. It is not—like strichnine, arsenic, iodine, opium, or mercury—an instrument with double edge, cutting equally for good or for evil, according to the skill or the incapacity of the physician. It is perfectly harmless, for I have taken it myself, in *larger doses* than are required for therapeutic purposes, with perfect impunity. The physician, therefore, who wishes to try it, can do so freely without fear of risk. Physiology leads to believe that all zymotic diseases depend on a fermenting or catalytic principle in the blood. Chemistry teaches us that in the presence of sulphurous acid and the sulphites no catalytic action can take place, and practical experience confirms the teachings of science, by showing us palpably that zymotic diseases, even in their most virulent forms, become completely neutralized by this remedy. Who, then, shall not try it, and bring it to the only test which can decide of its value—clinical experience? I stand at present nearly, if not entirely, alone in these countries as an advocate of this remedy; but if I am not mistaken, the discovery of the use of the alkaline sulphites in the treatment of zymotic diseases will one day rank with the greatest discoveries in medicine.—*Glasgow Medical Journal, Oct.* 1865, *p.* 297.

2.—THE USE OF THE HYPOPHOSPHITES OF LIME, SODA, AND POTASH IN REMITTENT FEVER, &c.

By Dr. H. S. Purdon, Belfast.

[This paper corroborates the views of Dr. De 'Ricci, as seen in the previous paper. Dr. Francis Churchill, of New York, some time ago pointed out the value of the hypophosphites of lime, soda, and potash in phthisis, but we do not think that his practice has been followed up in this country. These medicines we think are more likely to be useful in all kinds of diseases caused by fermentation of poisons in the blood, such as typhus, typhoid, scarlatina, small-pox, &c., &c., and probably in cholera, and even in the cattle plague now raging in this country. The experiments of Dr. De 'Ricci, as shown in the previous

paper, prove that they have a power of arresting this action of of fermentation similar to sulphurous acid in vinous fermentation.]

A hypophosphite is very soluble in the animal fluids, and is readily admitted into the circulation. Sugar also occasions them to be more easily assimilated: these facts have been proved by the observations of Mr. Taylor.

As regards the actions of hypophosphites on the system, Dr. Churchill considers that "they increase the nervous force, and are the most powerful hæmatogens; possessing all the therapeutic properties of phosphorus." They also seem to increase the appetite, check any tendency to diarrhœa, and occasion cheerfulness in children who have long been fretful and peevish.

In remittent fever occurring in children, great benefit is derived from their use, even in cases which seem at first sight to be hopeless; and where we have the tongue loaded with a creamy exudation, dark-coloured circles beneath the eyes, aphthæ in the mouth, distended abdomen, offensive diarrhœa, &c., the hypophosphites act like a charm, when other remedies have failed.

In giving the hypophosphites in the disease known as tabes mesenterica, rapid improvement does not take place; but it is nevertheless sure although slow. As regards their action in this disease, they appear to have the power of dissolving the tuberculous matter deposited in the abdominal viscera, possibly by causing disintegration of the fibrine.

It will be necessary, before using the hypophosphites, to improve the character of the biliary secretion; but in cases of simple gastric irritation I would have no hesitation in commencing their use at once. It is a curious fact, that children who are fretful, restless, and a torment to all within hearing distance, quiet down after a few doses have been administered.

The following formula is suitable for an infant, the dose being increased according to age:

℞. Hypophos. sodæ gr. vi.; hypophos. calcis, hypophos. potass. ana gr. iv.; glycerinæ ʒii.; aquæ ʒi. M.
Forty drops three times a day in a little water.

The accompanying cases have been selected for the purpose of illustrating the therapeutical effects of the hypophosphites, after failure of the usual remedies, in some of the diseases occurring in infants and children.

Sugar may be combined with the hypophosphites, as it fulfils a twofold object, viz:—disguising the taste, and rendering the hypophosphites more soluble, and for this purpose I think that the sugar of milk of the British Pharmacopœia is the most suitable.

Case 1.—*Remittent Fever.*—M. F., aged eighteen months. Tongue covered with a creamy exudation, dark-coloured circles beneath the eyes; aphthæ in the mouth; abdomen hot and distended; diarrhœa with stools of a most offensive odour; extremely fretful and peevish. Alteratives were tried, but without any improvement; but after recourse was had to the hypophosphites, in a few days marked symptoms of improvement presented themselves.

II.—*Remittent Fever.*—M. J., aged five years, a very delicate boy with a pale countenance. For some time had been very restless at night, with continual picking at the nose. These symptoms gradually merged into remittent fever; tongue of a strawberry appearance, stools very offensive, occasional convulsive seizures, and considerable thirst. The hypophosphites in this case were commenced at once, and in a fortnight the child was convalescent.

III.—*Remittent Fever.*—Wm. W., aged two years; symptoms —abdomen tympanitic, alvine evacuations dark-coloured and offensive, thirst, vomiting, countenance stupid and heavy-looking, pupils dilated, period of remission lasting about one hour. Treatment—he first had powders containing pulv. cretæ, sodæ siccat., and hydrargyri c. cretæ; but these not producing the desired effect, the hypophosphites were commenced. The diet during the disease consisted of milk and lime water, with the occasional use of arrowroot.

IV.—*Tabes Mesenterica.*—M. S., aged five years, began to "waste away" after an attack of measles. She presented all the appearances of a strumous diathesis; thorax on being examined was found healthy, and there was no cough. The abdomen felt rather hard, stools of a whitish colour; tongue clean for a few days, would then become foul and remain so for three or four days; appetite fair, and her hair comes away in the comb. This child was put upon the use of the hypophosphites, and in about three weeks' time was convalescent. One rather curious fact about this case is, that although the hypophosphites effected a cure of the tabes mesenterica, still they possessed no specific action over the formation of tubercle in other organs, as this patient died in about sixteen months from phthisis.

V.—*Gastric Irritation.*—Mr. J—'s child, aged eight months. Continual vomiting of a sour curdled-looking matter; nothing would lie on the stomach; very feverish and fretful. The gums were lanced: and for the vomiting the child got powders containing bismuth, calomel, and compound powder of chalk; but as the child gradually became worse although various means of treatment were tried, the hypophosphites were commenced, and the child is at present lively and healthy.

VI.—*Chronic Gastric Irritation in the Adult.*—Mrs. F. had for some time complained of irritation and pain in the stomach, increased on pressure; very restless at night, bowels irregular, tongue red and raw-looking, great thirst. The usual remedies, such as bismuth, various preparations of magnesia, &c., were tried without avail. Considering it a good case to try the hypophosphites, they were administered with the best results.

As it is impossible to cut short a disease such as remittent fever, the Latin proverb, *medicus curat, natura sanat morbum*, strikes us with full force, directing the physician to assist nature with as little fatigue to the patient as possible; the hypophosphites seem to fulfil all these indications, in causing sleep where slumber has been lost or disturbed, in relieving thirst, cleansing the tongue, increasing the appetite, correcting any intestinal disorder which exists, and this in a much shorter time than can be obtained by other remedies.—*Glasgow Medical Journal, October* 1865, *p.* 319.

3.—ON CONTAGION.

By Dr. Lionel S. Beale, F.R.S., Professor of Physiology and of General and Morbid Anatomy in King's College, London; Physician to King's College Hospital.

Although the subject of *contagion* may seem to have little connection with inflammation, I find that the consideration of the properties of living pus leads me into the discussion of the nature of contagious diseases, and I shall therefore venture to offer some remarks upon this most interesting subject.

Of the Vitality of Pus.—The vitality of the germinal matter of pus is exceedingly great. Pus multiplies very rapidly, and certain forms may be carried from one living organism to another without being destroyed—without losing their vitality. It is most interesting to notice that the faster the pus grows the more varied the conditions under which its life may still be carried on. Certain conditions which would have destroyed the life of the germinal matter of an epithelial cell may not destroy that of a pus corpuscle; the pus corpuscle may indeed flourish under conditions which would render the existence of the germinal matter of a normal cell quite impossible; and this power of existing under various conditions seems to increase as the multiplication of the mass of the germinal matter of the pus corpuscle proceeds. The capacity for living and growing under a variety of different conditions may proceed to such an extent that germinal matter originating in the organism of an animal may grow and multiply in that of man, and *vice versâ*. And we know that certain contagious diseases originating in

animals may pass to man, and it is not improbable that some of those emanating from the human subject may be communicated to animals.

As I have stated before, this power of living is so remarkable that the pus corpuscles, or portions of the pus corpuscles, may be transmitted through the air without loss of vitality. It is in this way may be explained, I think, certain phenomena known in connection with the propagation of purulent ophthalmia and other diseases in which pus is carried from one person to another. The pus corpuscles produced on the surface of the conjunctiva, or, rather, the minute offsets from them, may be transported through the air, or by clothes, &c., and, coming into actual contact with a conjunctiva properly prepared by morbid processes for the supply of nutrient matter to these corpuscles, they grow and multiply. In this way pus corpuscles, or portions of pus corpuscles, perhaps not the fifty thousandth or the one hundred thousandth part of an inch in diameter, may be transferred from one organism to another. Allied facts may be observed with reference to the propagation of gonorrhœal pus and I venture to infer that the poison of syphilis is really germinal matter, which passes in a living state from the infected to the sound organism, and grows and multiplies in it. Many of the highly important facts recently discovered by Prof. Boeck support this view.

Certain living particles which have directly descended from the living or germinal matter of the tissue or fluids of an unhealthy organism may be transmitted in a living state to a healthy organism, and, being there supplied with proper pabulum, grow and give rise to the production of new particles like themselves; and although the nutrient material may be somewhat different, yet they grow and multiply, as they are capable of living under a variety of different conditions. The action of vaccine lymph is, I think, due to the growth and multiplication in the vaccinated person of living particles which existed in the lymph taken from the vaccine vesicle. Nor is there good reason for denying the possibility of such living particles retaining their life when imperfectly dried, since we have the striking fact that many of the lower organisms retain their life although desiccation has been carried to a very considerable extent. We know that complete desiccation cannot occur without producing the death of any living particles; but comparative desiccation may actually occur, and the small amount of living matter remaining may be sufficient to induce the changes with which we are familiar.

The Nature of the Poison of Contagious Fevers.—I think the above general views may be extended to fevers, which, I believe, are due to the passage from one body to another of living par-

ticles. These living particles consist of germinal matter, and have descended from the germinal matter of the organism itself. Many have attributed diseases of this class to the introduction into the body of a very low form of vegetable organism. But it is very doubtful if the growth and multiplication of vegetable germs can proceed in the circulating fluids of a living body without causing death in a very short time; for the conditions favourable to their existence and multiplication are incompatible with the life of the germinal matter of the higher tissues. The germination and multiplication of very low vegetable or animal organisms in man and the higher animals are an indication not only that the death of the tissue has taken place, but that it is passing into a state of decomposition. It is true that bacteria have been detected in the blood of patients during life, but hitherto only in cases shortly before death, at a time when the blood in which they grew and multiplied was no longer fit for nourishing the tissues, and was itself passing into decomposition. Millions of bacteria exist in the softened outer portions of the fibrinous clot of an aneurismal sac, and, therefore, in such close proximity to the blood, that it is almost certain that, from time to time, some pass into the current of the circulation; but if this were the case they would be destroyed or else so altered that they would cease to multiply. For, before multiplication could take place, changes must have occurred in the composition of the blood which would render it incapable of supporting the life of its owner.

Many of these contagious maladies have been regarded as different species of "foul air" diseases. They are commonly termed *zymotic* or *fermenting diseases;* but no one has shown that these poisons originate in air, or that they really are of vegetable origin. Nor is it probable that they are a species of animal—a sort of parasite, as some have supposed. Nor, there is good reason to believe, would such poisons have ever arisen if man had known the exact conditions necessary to ensure a healthy state of existence. Man has produced these pests himself by establishing, without due care, artificial conditions of existence in which over-crowding, dirt, and terribly diminished supply of air play no unimportant part. Nor let us conclude too hastily that these are *necessary* visitations. The results of scientific observation and practical experience tend to show that such scourges are preventible. Not only so, but there is much to convince us that many of these diseases are not only fostered and propagated, but actually caused, in the first instance, by ignorance, obstinacy, and indolence in domestic management.

The above considerations seem to me to lead to the conclusion that the *materies morbi* concerned in the propagation of various

contagious diseases is not a low form of animal or vegetable organism, but germinal matter which was originally derived from that which exists normally in the higher organisms. The living germinal matter forming the *materies morbi* of contagious diseases bears somewhat the same relation to the normal germinal matter of the blood, lymph, or tissues, that a pus corpuscle does. Like pus, it results from the too rapid growth of the germinal matter. It is much to be regretted that the question cannot be definitely put to the test of experiment, but it will be admitted by all that the conditions which are favourable to the propagation of these contagious diseases are the very conditions which we should imagine would be favourable to the maintenance of the vitality of such masses of living matter as are supposed to be the active agents. If it were possible to produce this class of diseases in frogs or newts, I would almost undertake to make out the nature of the morbific agent as well as the changes which take place during the course of the disease; but as our observations are necessarily limited to man and the higher animals, in which minute investigation is remarkably difficult, much that I shall say will be but conjecture, although my conclusions are supported by many considerations.

It is not to be supposed that any one unacquainted with physiology would believe that a terrible and fatal malady could arise from the introduction into the body of a minute germ weighing less than the $\frac{1}{100000}$th of a grain; but to those familiar with *vital* phenomena many facts will at once occur which afford considerable support to such a doctrine. The multiplication of bacteria and low animal and vegetable organisms, so very minute and transparent, that they are scarcely visible even under a power magnifying 3000 diameters,—the subdivision of pus and mucus corpuscles which may be *seen* under the microscope,—not to mention the wonderful powers residing in the infinitesimal amount of matter constituting the spermatozoon, are facts which must at once destroy the validity of objections grounded upon the minuteness of the particles of living matter supposed to be the active agents.

The origin, formation, transmission, and effects of the different contagious poisons which affect man and animals will, no doubt indeed, be regarded as *mysterious* and *inexplicable* by those who support the dogma, that living things, like lifeless ones, are influenced by physics and chemistry only. But those who study the phenomena of living beings from a more general point of view will see that these phenomena fall into the same category as many other actions and changes peculiar to living beings. By attentively studying effects we may reasonably hope to learn something of the nature of the forces concerned in their production; but if we adopt the arbitrary dictum that all the

phenomena of living things are due to physical and chemical changes only, we shall not be likely to progress very far in such an inquiry as the present one.

The vitality of the Poison of Contagious Diseases.—The fact of the poison of contagious diseases retaining its activity for some time after it has been detached from the organism in which it was produced is not, as would at first, perhaps, appear, opposed to the view that this poison is living germinal matter directly descended from normal germinal matter; for certain kinds even of normal germinal matter retain their vitality for some time after they have been removed from the organism in which they were produced. I have demonstrated that the cells of the liver and other epithelial cells retain their vitality after they have been transferred to a glass slide, and a piece of skin and some other tissues may be detached, and their temperature very much reduced, without destroying their life; for if they be replaced in their proper position they reabsorb nutrient material and again become an integral part of the organism from which they had been removed; proving that the masses of germinal matter retained their vitality during the whole time they were separated—or they may even be removed from one organism and made to grow upon another organism of the same kind. As is well known, parts of the body may be exposed to extreme cold for a considerable time, so that sensation is destroyed and the circulation stagnates, without the death of the germinal matter of the tissues taking place; and as is well known, the death of many textures of the body does not occur until many hours after the cessation of the heart's action and respiration.

But there is still a stronger argument. We have the positive fact that pus will live for a considerable time in urine, and therefore we are quite justified in assuming that other kinds of germinal matter allied to pus, and capable of living under a still greater variety of conditions than pus, would retain their vitality in urine, fæces, and other excretions, as numerous facts establish is the case with regard to some forms of contagious matter. As we have positive evidence that minute particles of pus may pass through the air, or remain on sponges, clothes, &c., for many hours without their vitality being destroyed, is it not reasonable to assume that the living matter of contagious diseases, supposing it to be allied to pus, should retain its vitality under the same or under yet more adverse conditions? Does not this view receive confirmation from our experience with regard to the conditions which are favourable to the propagation of contagious fevers? A warm, moist atmosphere, small close rooms, with curtains, carpets, and plenty of clothes, rags, &c., so arranged as to cause air to be pent up in confined spaces with very slow interchange,—are the circumstances which

favour the spread of contagion; and a disposition to prevent currents of air from finding their way into every part or into any part of an apartment is a mental characteristic of many of those who are too often sufferers from the worst forms of contagious diseases; while has not experience taught us that the converse of all this almost certainly prevents the spread of contagion, destroys the active material, or renders its assaults perfectly harmless? And would not free change of air, washing, frequently shaking of clothes, extreme cold, dryness, or a very high temperature be likely to destroy the vitality of such particles of living matter as I suppose to be the active agents in the propagation of contagious disease?

It is not probable that the particles of germinal matter grow and multiply when removed from the living body. Multiplication could not take place as they are passing through the air; nor is it likely that their process could occur in particles attached to dry clothes. But the question whether such particles may grow and multiply in moist substances, as in excrementitious matters, remains open. It would be most interesting if pus or any allied form of germinal matter could be caused to multiply artificially, and the fact would doubtless excite much highly valuable speculation; but at present the experiments instituted for the purpose of determining this question have not afforded satisfactory results. No doubt multitudes of the germs of many contagious diseases are very frequently coming in contact with us; but, instead of multiplying at the expense of our nutrient juices, they die and become harmless. But, as is well known, there are conditions of the system which are favourable to the growth and multiplication of such disease-producing germs, and it is for us to ascertain exactly what these conditions are. There is much more hope that we may learn how men may be enabled to resist contagion or be protected from its influence, than that we shall ever be able either to extirpate the contagious poison, or even to confine it within a certain area. Moreover, the circumstances adverted to in this paper render it almost certain that if every disease-producing germ in existence could be destroyed at once, new ones—perhaps not of quite the same nature as those now existing, but very closely allied to them—would be generated. Although a state of society in which such care would be taken of the public health as would entirely prevent the production of disease-producin germs is theoretically conceivable, it is practically impossibl that such a state could be established in the present condition of the civilised world.

It seems to me improbable that we can distinguish the different kinds of specific disease-producing living particles from one another. I have endeavoured to show that every kind of

living matter exhibits certain common characters, and that the living matter of a high and complex organism is not to be distinguished from that of a low and comparatively simple one, by any peculiarities we can recognise, on submitting the matter to the various methods of examination at present known. The living matter of the tissue-destroying pus corpuscle resembles that from which the normal tissues are produced. It is only in the rate at which such masses multiply—the pabulum they are capable of taking up—the products resulting from their life and death—that the several kinds of living matter can be said to differ from one another, and these phenomena are all dependent upon the agency which I have spoken of as vital power. In fact, it appears probable that the living matter, which is the *materies morbi* of contagious diseases, differs from the living or germinal matter of ordinary pus and that of normal tissues, or the white blood corpuscles, &c.—not in form, in force, or in property—but in vital power. I think that if we consider the the difficult problem from this point of view we shall learn much from new work; but if we continue to regard these poisons as gases, or vegetable or animal organisms, or as ferments, or as inorganic matter, we shall never succeed in adding to our knowledge of vital phenomena. Most assuredly we should never cease to inquire until we have discovered the real nature of these terrible diseases which it is our duty to try to prevent, to mitigate, or to cure; for until we are acquainted with the exact nature of a disease, are we not at a great disadvantage in attempting to treat it?

[These contagious poisons doubtless produce their peculiar influence upon the organism through the blood, in fact, that they pass into this fluid, grow, and multiply there, giving rise to changes in its composition.]

Admitting that contagious poisons generally consist of living matter, and that this living matter enters the blood, let us inquire how the living particles may enter the vascular system where there is no inoculation—no solution of continuity of the vascular walls. We may explain the fact that of a number of persons equally exposed to the influence of a contagious poison, some will contract the disease while others will escape, by supposing that in the latter case the living particles are prevented from passing through the vascular walls, or that, coming into contact with the blood, they do not grow and multiply, but become destroyed.

How, then, do the living particles pass through the vascular walls and enter the blood, and what are the circumstances that would favour or interfere with their passage? Thin-walled capillary vessels, as is well known, come very near to the surface

in many parts of the body. Those of parts of the mucous membrane of the nose, mouth, and conjunctivæ, even in a state of perfect health, are covered with a very thin layer of protective epithelium, while those of the air-cells of the lung are practically bare. In many morbid states the epithelial covering of the mucous membranes enumerated above is very soft, and sometimes it is reduced to a thin layer of a soft pulpy mucus, in which any foreign particles would very readily become embedded. It is reasonable to suppose that the contagious germs find in this soft mucus a nidus favourable for their reception, and at the same time soluble materials adapted for their nutrition. They would grow and multiply, and probably minute offsets from them would soon find their way to the external surface of the capillary walls.

I have shown that there is strong reason for concluding that when the capillaries are much stretched, as when fully distended with blood, particles of living germinal matter, probably derived from the white blood corpuscles, may make their way through the walls with some of the serum, and grow and multiply in their new position. Thus, an "exudation" will in many instances contain particles of living growing matter, and these particles absorb nutrient matter, and soon become the spherical granular cells which are often seen external to the vessels in inflammation. They do not become aggregated together, as Dr. Bennett supposed, but each absorbs nutriment, and, just as in the case of all other masses of living matter, grows, and divides and subdivides. This view concerning the origin of many of the corpuscles in exudation is supported by the fact that in pneumonia and in some other conditions in which the capillary distension is very great, red blood-corpuscles, which are much larger than the particles of living matter just referred to, pass through the capillary walls without complete destruction of the vessel taking place. Every one who has made very minute injections is familiar with the fact that minute longitudinal rents or fissures may be made quite wide enough for a red blood-corpuscle to pass through edgeways. It is therefore certain that particles of minute size may pass through capillary walls without the occurrence of actual rupture.

Besides which, there are at very short intervals in the capillary walls masses of germinal matter or nuclei, which increase considerably in size when supplied with increased nutriment. These may divide and subdivide, and give rise to collections of little granular corpuscles, as seen in cases of inflammation of the pia mater, and also in cases of tubercular disease of the same membrane. In the situation of these nuclei the walls of the vessel are probably weak and liable to alterations, as they in-

crease or diminish in size. Hence there is no difficulty in accounting for the passage of minute particles of the living contagious germinal matter in cases in which the capillary walls have been unduly stretched and then rendered somewhat flaccid. The little particle of contagious matter having gained entrance into the blood, probably absorbs nutrient material rapidly. It is possible that fibrin may become coagulated around these little bodies just as if they were pus corpuscles, and the mass being too large to pass, becomes impacted in some part of the capillary system. The large size of the white blood corpuscles in very many blood diseases is also a fact not generally known, although of great importance, which I will discuss elsewhere. The nutrition and multiplication of the germinal matter would proceed and give rise to secondary phenomena familiar to all of us, and of the utmost interest; in those organs in which the circulation is slowest—as the spleen and liver—the conditions would be very favourable to the multiplication of such particles of living matter. I must not, however, pursue this part of the inquiry any further on this occasion.

Now, the state of things referred to above—a soft moist state of the mucous surfaces, a dilated condition of the capillaries, combined with a weak, flaccid state of their walls, which would follow long-continued congestion, and which is ultimately connected with a weak heart's action and feeble condition of the nervous system, are those which would facilitate the passage of such living germs as I am supposing, and are not these the very conditions which exist in the organism about to be the victim of a contagious fever? No doubt in these cases the composition of the blood is altered and its fluid constituents manifest a tendency to permeate the vascular walls more readily than in a perfectly healthy state. This state of blood would doubtless affect the action of the nervous centres presiding over the contraction of the arterial walls, and regulating the flow of blood through them, thereby influencing the nutrition of the part, and in this way a relaxed state of the arterial walls and a congested state of capillary vessels might be induced, or already existing, might be increased. It is this low and but too often ill-defined weak state of health that we should endeavour to detect by most careful observation, and at once treat. Nay, it seems to me almost certain that every serious acute disease dangerous to life to which we are subject is preceded by a condition of system which in many particulars is a departure from health. If this can be altered, the liability to the supervention of the acute attack no longer exists. It is in the direction of anticipating the occurrence of actual serious well-marked disease that those most earnest in advancing medicine may reasonably hope to do useful work. And it seems certain that the more minutely we investi-

gate, the more likely shall we be to learn how to discover and to appreciate that slight departure from the healthy state which precedes, and often by some considerable time, the development of many of the most serious and most fatal maladies.

I will try to sum up, in as few words as possible, the most important of the conclusions at which I have arrived with reference to contagious diseases.

The *materies morbi* of contagious diseases does not consist of lifeless organic or inorganic matter, nor of any form of gas or vapour generated in the decomposition of animal or vegetable substances, nor of any matter set free during the decomposition of fæcal or other excrementitious matter of animal origin; nor is it any species of animal or vegetable organism or parasite; but the active contagious material consists of exceedingly minute particles of living germinal matter which may be regarded as the direct descendants of the germinal or living matter of an organism which has been for some time living under unusual conditions. Contagious poisons affecting men and animals have originated in their organisms. The living or germinal matter of some contagious diseases originating in the bodies of animals may grow and multiply in man, and *vice versa*. These particles of living germinal matter may retain their vitality for some time after they have escaped from the seat of their formation. They may pass through the air or be preserved in clothes, or various fluids, or moist solids. The smallest particle (less than the $\frac{1}{100000}$th of an inch in diameter) being introduced into the body already in a fit state for its nutrition, may grow and multiply, giving rise, in due time, to the symptoms characteristic of the particular disease, and producing myriads of particles like itself. But it is probable that such particles, being introduced into a perfectly sound organism in a state of perfect health, would not grow and multiply, but would die, or, in other words, such an organism would resist the influence of the contagious matter. Some of the germinal matter forming the *materies morbi* of certain contagious diseases may retain its vitality for a considerable period of time in a comparatively dry state, like vaccine lymph. Knowing what we do of the protecting influence exerted by vaccination, it seems probable that the ravages of many other contagious diseases besides small-pox may be mitigated or prevented by the inoculation of certain forms of contagious matter which would produce allied but much less severe forms of disease. It seems desirable that numerous experiments should be instituted on cattle with the object of ascertaining if any such protective influence would be really exerted.—*Medical Times and Gazette, Sept.* 9, *and* 23, 1865, *pp.* 273, 329.

4.—ON OZONE.

By Dr. T. Moffatt, Hawarden.

In *The Times* of August 26 and 30th, there were two letters on "Cholera and Ozone," in which directions are given for the production of ozone by the use of phosphorus, and the latter is recommended as a disinfectant. For upwards of seventeen years Dr. Moffat has used phosphorus for producing ozone, and for five years he has employed it as a disinfectant.

In a paper "On the Luminosity of Phosphorus in connexion with Atmospheric Conditions," which I read at the Cambridge meeting of the British Association in 1862, I stated that phosphorus was a valuable disinfectant, but that it was effective only during its luminous condition, as ozone is formed only when it is luminous.

The luminosity and non-luminosity of phosphorus are influenced by atmospheric conditions. High pressure, a low degree of temperature, and wind from the north points of the compass are the conditions of non-luminosity; and low pressure, high temperature, and wind from south points of the compass are the conditions of luminosity. The former atmospheric conditions are those of cholera periods, and cholera disappears with the setting in of the latter.

About the 1st of September, 1853, cholera appeared in Newcastle. On the 20th the number of deaths was—cholera, 108; diarrhœa 10. On the 19th the south, or ozoniferous, current of the air set in and continued. On the 28th the number of deaths reported in *The Times* was—cholera, 18; diarrhœa 2. From the 1st of September to the 19th the mean quantity of ozone was scarcely 1·0 of my scale; but from the latter date to the end of the month it ranged from 3 to 8 daily. The epidemic in London in 1854 disappeared with the setting in of similar atmospheric conditions.

For purifying apartments I use phosphorus in the following way:—I take a quart bottle with a wide mouth, into which I put rather more than half a pint of water; a piece of cork carrying a flat piece of phosphorus with a clean cut surface, floats upon the water. The mouth of the bottle is loosely covered with a cork. The bottle is then placed, first in one part, and then in another, of the apartment to be purified until the peculiar smell of ozone is detected, or until my test papers indicate 1 of my ozone scale. The process of purifying may be performed night and morning, or oftener. For purifying air in the neighbourhood of street gratings or in sewers, I simply suspend a piece of phosphorus from the grating. In apartments the temperature may be sufficiently high to keep phosphorus luminous under all atmospheric conditions; but

in sewers it will be luminous and non-luminous according to the height of the barometer, the temperature of the surrounding air, and the direction of the wind, and ozone will be produced only when it is luminous.—*Lancet, September* 9, 1865, *p.* 303.

4.—WHAT IS SCARLET FEVER?

By Dr. William Addison, F.R.S., Brighton.

The order of events observed in scarlet fever is as follows. First, fever; secondly, a rash upon the skin, sore-throat, and swelling of the glands about the throat; thirdly, exfoliation of the cuticle, mucous discharges from the throat and nose, and perhaps abscess of the submaxillary glands.

This order or succession is typical of the order of events as they take place in the blood, which we make out to be as follows.

1. Infection of the corpuscles by a miasm inhaled through the lungs. This is announced by symptoms of fever.

2. The corpuscles of blood being disordered by a specifi poison, the waste materials which they discharge into air and into the liquor sanguinis are altered in quality and quantity. Less carbon is expired by the lungs (Graves), and less urea discharged by the kidneys (Simon); but a new contagious poison is developed, which gives the liquor sanguinis pathological properties—renders it impure.

3. Impurity of the fluid of blood excites local inflammation, which in scarlet fever is seen in the skin, throat, and glands about the throat. The local inflammations comprise the production of a vast brood of epidermal and mucous, or of epidermal mucous, and pus-cells.

4. These cellular productions are discharged from the skin by exfoliation of the cuticle; from the throat, by its mucous discharges; and from the glands about the throat, by abscess and suppuration. That they carry off a *materies morbi* from the blood seems proved; because the exfoliating cuticular cells and and the breath of the patient are vehicles of a contagious poison. Moreover, all symptoms of fever and inflammation disappear upon their discharge.

5. The actions in the skin, throat, and glands about the throat, are called *critical*, because, if any interruption or check be given to them, the task of eliminating the poison from the blood is thrown upon the cells of the secreting surface of the kidneys or other internal organs, to the greater danger to life.

The rash and affection of the throat in scarlet fever are forms of inflammation; and the action in the glands about the throat

comprises abscess and suppuration? Can these things be beneficial?

If a thorn pierce the flesh and remain there inflammation and abscess ensue. The action loosens the foreign body, so that it can be easily removed. A slough cannot be detached without suppuration. In a comminuted compound fracture, loose pieces of bone are detached by inflammation, suppuration, and granulation. *Granulations* and *pus* are two forms of cell-growth (inflammation, abscess, and suppuration, are simply words applied to the attendant phenomena).

In severe boils and carbuncles, dead connective tissue lies beneath the living skin; and it is only by inflammation, abscess, suppuration, and granulation, that it can be loosened and discharged. The work is transacted without any loss of blood. Hundreds of blood-vessels are first sealed up; and then these and other bonds of connection are severed by the absorptive properties of the cells of granulations and pus; whereupon, the slough is easily removed, and the wound heals or is cured spontaneously.

In necrosis of bone, the meaning of inflammation and suppuration is the loosening and detachment of the dead bone. Here the work to be done lies deep beneath a mass of living muscles, and is necessarily an extremely difficult one, requiring assistance from the hands of the surgeon. Nevertheless, to the philosophical observer, the intent of the natural efforts is plain and evident. In this example, so difficult is the work, that a host of material is spoilt in it; hence the necessity of conduits or sinuses for its escape. Should the surgeon try to close the outlets and succeed, nature resents his interference and speedily forms others; but if he remove the dead bone—even if it be with gauges, saws, and chisels—his interference is placidly accepted, and the whole chain of phenomena subside into cure, which includes the growth of a new bone.

Without further multiplying examples, it may be said generally: In all parts of the body if dead and injurious matter is to be got rid of, inflammation, abscess, suppuration, and granulation, are the means. And if they are so, they are the means of cure. It is upon these visible examples of cure that we base the principle of Cell-Therapeutics.

In like manner, in fever, where hurtful matter must obtain outlet from the blood, some more or less pronounced form of inflammation, some unusual cell-production is observed. For what are the facts?

In small-pox, there are hundreds of abscesses in the skin, every one of them a focus of cell-growth. The blood is continually passing the abscesses or pustules; and it improves in quality, or becomes better fitted for its normal purposes, as they

increase in size and fulness. Growth of the pustules and a beneficial change in the qualities of blood are concomitant events. For, if the maturation of the pustules be checked, the symptoms of the patient become worse. Therefore we say the pustules flourish and multiply by the absorption of morbid matter from the fluid of the blood. Similarly, in scarlet fever, myriads of little foci of an unusual cell-growth are established with phenomena of inflammation in the skin. The exuberant morbid cuticle produced is composed of millions of adherent-cells, whose growth is concomitant with a healthy change in the blood. With the change in the blood, the conditions which encouraged preternatural cell-growth are exhausted; the growth ceases; inflammation subsides; the morbid cuticle exfoliates or sloughs off; and the patient is cured.

No distinction can be shown between the cells of laudable pus—those of a healthy suppuration, which are loosening and fitting for discharge a foreign body, a slough, or dead bone—and the deep cuticular cells of the skin which, in scarlet fever, in their outward progress, multiply and grow upon morbid elements in the fluid of blood. Nor can any difference be shewn between these cells and those which exfoliate in abundance mixed with the mucous discharges from the throat and nose. The doctrine of cell-therapeutics is illustrated and confirmed by phenomena of exanthematous fever.

In scarlet fever, it is exemplified in exfoliation of the morbid contagious cuticle, which is established by rash on the skin; and the rash is a form of inflammation.

These are reasons why no one thinks of curing, in the sense of suppressing, the pustules of small-pox, or inflammation in the skin in scarlet fever. And when the submaxillary glands swell and inflame and tend to abscess, it is well known to be wrong to resort to strong measures to suppress it. These outward manifestations, so far from constituting the disease, are actions necessary to the cure of the disordered blood. It is in harmony with our doctrine that, in all cases of scarlet fever where there are no complications, experience has shewn that nothing more is necessary in the medical treatment, than:

To keep the patient warm in bed, in a well ventilated, airy chamber; to relieve him—having reference to the work going on in the blood—from pain, restlessness, and other discomforts;

To take precautions that the diet be cooling and simple;

To watch and regulate the function of all those organs which give outlet to excretionary matter from the blood—the skin, kidneys, lungs, and bowel: and to guard against the spread of contagion.

The sequence of events in the blood in scarlet fever, as we have described it, is natural and logical. A poison in the air

causes disorder of the corpuscles of blood; disorder of the corpuscles causes distemperature or impurity of the fluid in which they swim; and impurity of the fluid of blood causes unusual cellular growths, with phenomena of inflammation, the cellular growths discharging the impurity.

It corresponds with the order of the symptoms as they come on and as they go off. At the onset, fever precedes the rash, and the rash precedes exfoliation of the cuticle; and, in the going off, fever subsides when the rash is at its height, and the rash subsides when the morbid cuticular growth has performed its task, or is prepared for exfoliation.

But it is to be observed that, in proportion as disorder of the corpuscles diminishes by their throwing off morbid matter, in like proportion impurity of the fluid of blood is increasing, and the fluid of blood recovers its normal condition in proportion to the activity of the local cell-growths which flourish upon the morbid matter in it.

Relief of the corpuscles devolves a pathological state upon the fluid of the blood; and relief of the fluid devolves a pathological state upon the skin, upon the skin and throat, or upon the skin, throat, submaxillary glands and kidneys. That is to say, cure of the corpuscles transfers morbid matter to the fluid of the blood; and cure of the fluid of blood involves the transference of morbid matter from it to some local part by the agency of cells. These statements contain no more than the received physiology of blood. In respiration, the corpuscles transfer poisonous matter—some form of cardon—to the air; and a healthy state of the fluid involves the transference of poisonous matter—urea—to the kidneys. And here is the most important point of this discussion.

We must recognise the mixed character of the actions of cure. They are physiological and pathological at the same time. The pustules of small-pox are physiological to the blood, but pathological to the follicles of the skin; as shown by the deep pits and scars remaining after cure. The rash and double cuticle of scarlet fever may be regarded as disorder to the skin, but healing to the blood.

In fever, one part recovers at the expense of another. The corpuscles of blood infected by an aërial poison recover at the expense of the liquor sanguinis; and the liquor sanguinis recovers at the expense of some local part.

These observations have their bearing upon the affection of throat in scarlet fever. There can be no doubt of this being part of the critical actions in that species of fever. If so, it is physiological to the blood, but pathological to the throat itself; and we must preserve the power, or relieve the pain, of swallowing. According to our view the object of gargles,

poultices, warm fomentations, leeches, or a blister, as applications to the throat, is not to cure the inflammation, and thereby suppress the increased mucous discharges from it; but to moderate and limit the actions going on with reference to the comfort of the patient in swallowing. This being done, cure of the throat will take place with cure of inflammation in the skin; and cure of inflammation in the skin takes place when the fluid of the blood has rendered up its morbid material.

It would be to ignore the teaching of the microscope, did we hesitate to declare our conclusion. Cure, whether of external injuries or of scarlet fever, is wrought by cells with characters as fixed and specific as any of the other things of Nature. No person, at his will, can command the growth of skin or bone, or furnish a safe outlet for poisonous matter in the blood. Nevertheless, these things are accomplished; and our researches point out the agents employed; viz., *various broods of cells.*

The physician and surgeon each in his department can watch and, in a measure, regulate the work—remove hindrances; promote or moderate, encourage or discourage, the preliminary actions; but the essential elements of cure—cellular bodies with their rapid multiplication, growth, metamorphoses, and deep interior vital properties of sedative absorption—are not producible by manual art or physic.

The orderly course of the majority of cases of scarlet fever—the fixed characters and place of the local actions, and the relief which these afford to the patient when not exceeding their proper limits—demonstrate that the disease has a specific method of cure. It requires vigilant medical supervision, because of the mixed nature of all the actions of cure—partly physiological and partly pathological; and because of the difficulties and complications so apt to arise.

The history of every outbreak of the disorder shows how various these complications are in different persons; how they protract or interrupt the actions of cure; and how often they cause its failure. These complications spring up from various quarters. Usually they will be found based upon one or other of the following grounds.

Because some previous malady in former years has crippled an important organ, and thereby entailed upon the individual what is called "delicacy of constitution."

Because, from unwholesome diet or overcrowding in unwholesome air, the blood is impoverished and weak at the onset of fever.

Because a chill or other accident has interrupted the specific local action and its cellular exfoliations; or,

Because, from some degenerate anatomical lesion, spoiled matter has ebbed back into the liquor sanguinis, and redis-

turbing the corpuscles of the blood, has renewed symptoms of fever.

What is meant by the crippling of important organs as a source of complication in fever?

If a child be severely burnt about the face and neck, the wound occasioned by the injury heals; cure is effected; but an ugly scar remains, which is permanent, and greatly circumscribes the movements of the head or mouth. Similar things may be said of a severe burn at the elbow or upon the fingers.

A comminuted fracture may be cured; but the injured limb never recovers the strength of the sound one. If a fracture pass through a joint, the injury may be cured, but the joint never recovers its natural mobility.

Pleurisy and inflammation of the lungs are cured; but the respiratory organ does not recover its pristine condition.

And so most other internal maladies may be cured, and yet the organ the seat of them never recovers. Cure and recovery are terms of different meaning.

All the most recent pathological investigations demonstrate in every internal malady, particularly in children, that, though one organ or texture has suffered more severely than the rest, from which therefore the disease derives its name and most prominent features, yet it is not there that the whole disorder is found. Anatomical changes are not confined to that organ, but are more or less extensively present in others also. When, therefore, we speak of infants dying of teething, convulsions, or pneumonia, or of youth dying of measles, hooping-cough, or scarlet fever, it is necessary to bear in mind that these designations or words convey no information whatever as to the ramifications of the disorder. It is from examination of the dead that we see, besides the organ from which the chief symptoms of the malady arose, that several others are the seat of minor anatomical changes which contributed to the fatal issue.

This fact being demonstrated in the fatal forms of illness, there is no reason for doubting it in the more numerous cases where health is regained. On the contrary, there is every reason to conclude that what are called complications and sequelæ of fever are the more prominent of these minor anatomical changes gaining strength and evolving symptoms.

When, then, we discourse of infants recovering from teething, convulsions, or pneumonia, or of youth recovering from measles, hooping-cough, or scarlet fever, it must be borne in mind the term recovery can mean no more than the relief of the patient from the chief malady and all its pronounced collateral anatomical lesions. Things latent—anatomical changes which give no sign—may, with the recovery, return to their natural state; but it does not necessarily follow they do so. On the contrary,

the permanent scars and cripplings which remain after the cure of severe burns or other surgical injuries, and the pittings of the skin in small-pox, render it almost certain that what is called "delicacy of constitution" is the expression of the non-recovery of one or more important internal textures which have been cured of the malady that affected them, but which have not been restored to their free natural state. As when pleurisy has been cured, but the lung does not recover, it remains adherent to the wall of the chest; or as when rheumatic fever is cured, with permanent thickening of the coverings of the heart, or pneumonia cured, with consolidation in some part of the lung. All these and such like conditions are positive grounds for more or less constitutional infirmity; they are important items in the history of future fever, and give aptness to the popular saying: "He has never been well since the measles, hooping-cough, or scarlet fever." Organs in these weakened conditions may not betray their weakness by moderate using, but if put to the slightest unusual stress, the defect is proclaimed.

"I do not exaggerate," says an eminent pathologist, "when I state that four-fifths at least of the old men, whose organs I examine after death, present evident incontestible traces of disease, not of recent disease, but of a former malady." Again, another says: "It is not after birth only that man, for the first time, experiences those maladies which afflict his race. Their origin must be sought in a remoter source. They commence with organisation; and the annals of medicine present a number of facts which attest that children may be born healthy, sick, or recovered from former disease." In the Children's Hospital at Vienna, it is calculated that not more than 20 per cent. of the inmates are free from some form of constitutional infirmity. Whenever the nutrition of the child has been imperfect, disorders associated with poverty of blood become widely diffused, materially influencing the mortality at an early age, and if the age of childhood be survived, affecting the future health of youth and manhood.

When, then, we speak of a patient being cured, or of his recovering, it is necessary to agree upon what is meant by the words. Cure does not mean that all the organs or textures implicated in the disorder—all the anatomical changes incident to it—have returned to their natural state; for, though we may presume, we cannot know in the living body that such is the case. No affirmation can be made respecting thickenings, scars, puckering, and cicatrices, in internal organs, which have no present symptoms other than those comprised in the terms delicacy of constitution.

The term recovery is applied to persons who have regained

health sufficiently to return to their accustomed avocations: and the physician dismissing his patient hazards no opinion about the state of organs which give out no symptoms, but which, nevertheless, may be a source of complication, should hereafter scarlet fever make its attack. These observations receive illustration from the history of scarlet fever itself. It frequently happens the patient to all appearance has recovered, but the kidneys have not regained their natural state; a little time elapses, and their weakness is proclaimed by dropsy—the dropsy depending upon the enfeebled condition of the kidney, and the enfeebled condition of the kidney arising from the just passed fever.

Lastly, as regards these internal anatomical disablements, it has been remarked of external wounds which have healed and cicatrised—that is to say, have been cured—that when subsequently fever or other maladies arise, the scar of the old wound is very apt to become painful, and a focus of renewed inflammation. Forms of inflammation are necessary to the cure of exanthematous fevers, and an internal puckering or cicatrix may complicate the course of scarlet fever, by taking on some irritative morbid action. Sanitary proceedings and dietetic rules will not efface the permanent marks of the cure of former maladies, nor restore to their natural vigour damaged organs.—*British Medical Journal, Oct.* 7, 1865, *p.* 364.

6.—ON THE TREATMENT OF SCARLET FEVER.

By J. L. Milton, Esq., Surgeon to St. John's Hospital for Skin Diseases.

For many years, plans of treatment have been before the world which, so far as we can judge, ought to have almost as effectually defeated the inroads of this malady as vaccination has defeated small-pox; yet week after week and year by year this relentless scourge sweeps away its victims, not by hundreds but by thousands. There must be something strangely wrong in a system which presents such a sad and startling contradiction as this.

Long ago I endeavoured to bring under the notice of the profession a mode of treatment which had proved very successful in Germany, but the attempt met with no response except from Mr. Erasmus Wilson, Dr. Routh, the late Dr. Snow, and one or two others. It consists in daily rubbing with hot fat or lard, and the manner in which it checks and quells the violence of the disorder is, if the accounts given be true, most extraordinary. Death is a rare result; the patient never takes cold; dropsical symptoms are almost unknown, no infection is given, because the sources of it are mechanically closed, the distressing

heat and irritation of the skin are abated, and, according to Dr. Routh, the pulse will fall thirty beats in three hours.

All that needs to be done is to rub the patient over from head to foot with fat; lard or fat bacon is the best material, and the salt should be removed as far as possible. The rubbing is to be done once at least, twice if thought proper, in the twenty-four hours. No harm can come from rubbing in too much; a great deal may ensue from rubbing in too little. The patient wants no washing, may wear the same clothes all the time, and requires little medicine and no precautions beyond those which common observation would direct.

The next best plan, but yet seemingly behind it in efficacy, is that of cold affusion, a plan attended with such benefits that one is puzzled to know how it ever came to be abandoned. Bateman lingers and dwells with fervid energy upon the wonderful soothing powers of cold affusion, the great febrifuge as it has been justly called. For ten years he says he had used Dr. Currie's plan without once seeing inconvenience, much less injury, from it.

Mr. Wilson considers sequi-carbonate of ammonia to be a remedy, which in its power over scarlet fever and rubeola, may be ranked with quinine in ague, iron in erysipelas, arsenic in eczema, and sulphur in scabies. I think myself that the success recorded to have followed the use of this remedy is among the most striking triumphs that discovery can boast, and its success in small-pox is equally cheering. Dr. Witt says, "It is the only remedy yet known which appears to have any decided effect upon this terrible malady;" and Mr. Wilson adds, "My own experience of the sequi-carbonate of ammonia fully corroborates the value of Dr. Witt's suggestion, and I feel that the adoption of this method cannot be too forcibly pressed upon medical men." In scarlatina the success has been marvellous. Out of several hundred cases one gentleman did not lose more than one in a hundred. Mr. Henry Jackson, of Sheffield, with his father, treated patients in this way for fifty years, in which time they did not lose more than four patients, and they died from typhus following the scarlatina. Another gentleman reports that he rarely lost a patient during twenty years' use of the remedy, whereas his successor, who rejected the treatment by ammonia, lost seventy-four out of a hundred and six cases in a single epidemic. These results contrast strongly with the havoc this dreadful complaint used to make under the treatment with antiphlogistics, two, three, and even four or five deaths in a single family, and which I am much inclined to believe from what I saw of it in my younger days, never saved a single bad case, if it even did not hasten the progress of thousands to the grave.

It does not seem necessary to prescribe anything with the ammonia. From three to six or seven grains, according to the age of the patient, may be given at first every hour or two till a decided effect is produced upon the disease, after which it may be taken less frequently. Simple or cinnamon water seems to be the favourite vehicle, but nothing can answer better than camphor mixture. In some slight cases, where there is not much difficulty in swallowing, ammonia may be given in the form of an effervescing drink, the carbonate in solution being mixed with lemon juice.

Belladonna has obtained a high reputation on the Continent, not only for its curative but its preventive powers in scarlatina. Some of the German physicians seem to think it is the best remedy in use; one of them goes so far as to say that it may be considered as effective against scarlatina as vaccinia is against small-pox. Even supposing this view to be overdrawn, enough still remains to show that belladonna does exert a most powerful control over scarlatina, and that there is every reason to believe, if it were freely and judiciously used at the outbreak of an epidemic, the number of fatal or even serious cases would be materially diminished.

It may be given in the form of extract dissolved in water, sweetened and flavoured with orange, cinnamon, or nutmeg; about three grains of the extract to an ounce of fluid are perhaps the best proportions. Of this solution two or three drops may be given to an infant under a year old twice a day, three or four drops to a child between one and two years old, and from this time of life a drop may be added for each succeeding year.

These, then, are the remedies which the experience of very successful practitioners warrants us in selecting as the most reliable—Cold bathing, rubbing with fat, ammonia and belladonna. They are few, but potent, and all the more valuable because they are few. All the other means, such as gargles, aperients, &c., are only auxiliaries, for the use of which no general rule can be laid down, but which the experience of every one capable of profiting by experience will teach him how to use.—*Milton on Diseases of the Skin, p.* 73.

7.—ON THE TREATMENT OF GOUT.

By Dr. H. Bence Jones, A.M., F.R.S., &c.

In the present state of our knowledge the treatment of gout may be divided into two parts: first, the specific; and second, the expectant treatment. Each method has its own advantages and disadvantages, and by the right use of both proceedings the greatest good with the least harm may be attained.

The specific treatment aims to get rid of the attack as soon as possible; that is, to put an end to the pain at once; to stop the fibrinous and crystalline thickening of the joints, and to allow the patient to return to his usual mode of life in the shortest possible time.

The disadvantages of this treatment are, first, that the specific sometimes acts more violently than is intended; and secondly, that cutting short an attack leads more quickly to a return of the disease, because the usual mode of life is that which has caused, and therefore will again cause, the gout; and thirdly, that the urate of soda existing in excess in the serum and diffusing into all the textures, where it is oxidised, if stopped in its active oxidation in any part, is more liable to set up a process of active oxidation in the fibrous textures of some internal organ, as the stomach, the brain, or the heart.

The expectant treatment aims to keep the gout fixed in the extremities until the textures and blood are freed as much as possible from the urates by oxidation, and to effect a long-continued change for the better in the usual mode of life, at least during the illness; and from both these causes a long interval is likely to intervene between the fits of gout.

The disadvantages of this treatment are, first, that the patient may get very feeble from the long-continued inflammation and confinement, and that out of this other ailments may thus arise; secondly, that the joints, in consequence of the duration of the inflammation, may become much more thickened by fibrin and urates than they otherwise might be, and that thus also the general health may give way from the loss of exercise.

The value of the specific treatment is seen when some more important organ than a joint is attacked by violent gouty or rheumatic inflammation. Then, to avoid irreparable injury to the organ, the specific inflammation must be stopped as quickly as possible. Acute inflammation of the eye furnishes by far the most striking example of the use of colchicum. By the specific treatment the eye may be saved; by the expectant treatment it will be lost; and the activity of the specific treatment must bear a direct proportion to the intensity of the inflammation. In a slight attack the expectant treatment alone may be required, but in a violent outburst the most energetic specific treatment, even with the help of local or general bleeding, will scarcely be able to preserve the sight of the inflamed eye.

The specific treatment consists in giving colchicum, veratria, sabadilla, and different quack medicines the composition of which is unknown, but which probably contain one or other of these remedies.

By far the most popular specific is colchicum; and if the action of this substance was fully known the action of all the other gout specifics would be understood.

There is no question that the alkaloid colchicine is the active substance in colchicum; and, though this substance is not yet isolated and analysed, there are good grounds for belief that it closely resembles veratrine, perhaps as closely as quinine does cinchonine.

Colchicine $= CxHyN_2Oz.$
Veratrine $= C_{64}H_{52}N_2O_{16}.$
Strychnine $= C_{42}H_{22}N_2O_4.$
Quinine $= C_{40}H_{24}N_2O_4.$
Cinchonine $= C_{40}H_{24}N_2O_2.$
Morphine $= C_{34}H_{19}NO_6.$

It is very evident that the analyses of these different alkaloids gives no clue whatever to their medical properties; and so the analysis of colchicine will give no explanation of the mode of its action. But, however much these alkaloids differ in their action, they all have this in common, that they act energetically on the nervous system.

The problem to be solved is, how does colchicum stop the excessive oxidation set up in the parts where the urates are most liable to accumulate, partly, perhaps, in consequence of the non-vascular nature of the textures?

That colchicine acts as a diuretic, and throws the uric acid out of the blood, is not capable of proof, and if it were would not give any explanation of its action on the joint. That colchicine promotes the oxidation of the uric acid by directly furnishing oxygen, as peroxide of lead might do, is contrary to all chemical probability. There remains the unproved assumption that colchicine, like these other alkaloids, acts on Dr. Liebreich's protagon that the alkaloid has a chemical action, by actual contact with the nerve substance of ths blood vessels, where the gouty inflammation is going on, causing such an action on the vessels that the inflammation ceases.

This assumption makes the action of colchicine comparable with the action of veratine, strychnine, and morphine, all of which act with intensity on the nervous substance; and this assumption leads to a conjecture as to the action of quinine, that it also may act on the nerves of the blood-vessels, stopping the internal congestion, on which the external rigor of ague depends. The deafening and prostrating effects of large doses of quinine can arise only from an action on the auditory and cardiac nerves, and the arrest or prevention of an ague fit can best be comprehended by the assumption that quinine acts

on the nerves of the capillaries, stopping congestion; whilst colchicine acts on the same system of nerves, stopping inflammation.

M. Roudanowski has stated to the Académie des Sciences that, after poisoning animals by strychnine, nicotine, opium, and chloroform, he has detected by the microscope changes in the nerve cells or in the myeline; but his observations cannot yet be received as conclusive.

In M. Laville's specific, veratrine is probably the active alkaloid; most probably a small amount of morphine is also dissolved in the wine with which it is prepared. It is said to be made from sabadilla seed, but whatever the source or nature of the alkaloid, it must have an action corresponding to colchicine, and the good and the harm from this specific cannot be much more nor less than the good and the harm of colchicum. It cuts short the attack, and thus saves the injury to the joints from the continuance or severity of the inflammation; but it does this by stopping the oxidation of the urates in the textures, and hence a relapse or renewal of the inflammation more quickly and easily takes place.

Moreover, like all other specifics, it gradually loses its effect when it has been used in many attacks, and one at the least of those who have been its most public supporters have abandoned it for some fresh, though far less potent, remedy.

Used in half-drachm doses every four hours, or one drachm doses twice or thrice daily, it acts often most decidedly. If anything, it causes less action on the stomach, and more action on the bowels than colchicum, and from the disposition to drowsiness which it frequently occasions, probably the irritative action is moderated by some opiate.

There can be little question that colchicine used by subcutaneous injection into the neighbourhood of the inflamed part would put an end to the attack; but the danger of an overdose would, perhaps, be greater than when taken in by the stomach, and the benefit derived from its use would not compensate for the fear of its abuse. It would probably act more quickly and more strongly than when taken into the stomach, but this rapid relief would be gained at much greater risk to life from the alkaloid acting on the nerves of the heart and causing dangerous syncope. Moreover, relief from pain and time for the full action of the colchicine when taken by the mouth may be obtained by the subcutaneous injection of one-fourth or one-third of a grain of acetate of morphine in ten or twelve minims of water into the neighbourhood of the inflamed joint.

Late one evening I was sent for to a gentleman suffering with a most violent attack of gout in the knee; the heat and the pain were excessive. There was some swelling and some red-

ness. The attack had begun in the previous night, and had increased in intensity all day. I injected the third of a grain of morphine into the inside of the thigh near the knee, and gave a drachm of Laville, ordering another drachm to be taken when he awoke. He slept for upwards of six hours without waking, and he seemed very certain that but for the injection the night would have been passed in even more agony than the day. After four drachms of Laville the attack subsided, and the following night no morphine was required.

In sciatica the use of the subcutaneous injection is most beneficial; sometimes almost whilst giving the morphia the pain subsides, and in eight or ten minutes drowsiness comes on, and sound and continuous sleep follows; but the alkaloid acts more strongly than when taken into the stomach, and an overdose may easily be given, and the poison is beyond the reach of an antidote.

The expectant treatment consists in preventing the accumulation of the urates in the serum and textures, and in promoting its elimination and oxidation.

The accumulation of urates is greatly to be prevented by a strict diet, chiefly as regards the quantity of animal and vegetable albuminous food that is eaten.

The elimination of urates is best effected by washing the serum and textures—that is, by increasing the flow of urine by means of water or diuretics. When the serum is comparatively free from urates, then the urates in the textures diffuse back into the blood and may be thrown out.

The oxidation of the uric acid in the textures and blood can be effected directly or indirectly by air, diet, and medicine.

So that the expectant treatment consists of diet, to prevent accumulation of urates, and to promote its oxidation; diuretics to promote its elimination; and air and medicine to promote its oxidation.

During and after an attack of gout, when thickening of the joints exists, medicines that promote the absorption of the effused fibrin and serum are very useful. Of these iodine externally and iodide of potassium with alkalies internally are the most efficacious. Iodine, perhaps, acts indirectly as an oxidiser.

But first of the diet:—

Let us suppose that the minimum diet of health may be represented by 10·5 grammes (162 grains) of soluble nitrogen, and 240 grammes (3696 grains = 8 ounces nearly) of soluble carbon—

If one ounce of meat when dry contains 108 grains of nitrogen and 33 grains of carbon; or,

If 1 egg contains 118 grains of nitrogen and 62 grains of carbon.

And one ounce of butter contains 355 grains of carbon,

And 5 ounces of dry bread contain 232 grains of nitrogen and 464 grains of carbon,

And 21 ounces of arrowroot contain 3633 grains of carbon,

Then it is easy to see that 2 ounces of dry meat, or 2 eggs, or 5 ounces of bread will give more nitrogen than the system requires to repair ordinary losses, and the excess may have to be thrown out, partly in the form of urates, when the oxidation is insufficient to produce urea.

If 2 ounces of dry meat or 2 eggs only are taken, about 10 ounces of butter would be necessary to furnish the fuel and power for the system, or an equivalent quantity of fat must be absorbed from the stores deposited in the cellular tissue. Or, if 5 ounces of dry bread only were eaten, then above 9 ounces of fat must be taken up in twenty-four hours; but 2 ounces of dry meat, or 2 eggs, or 5 ounces of bread, requiring the wasting of the body by 9 or 10 ounces of fat daily, could not long be endured. Moreover, these quantities of nitrogenous food produce more uric acid than a less nitrogenous diet would do.

If a little more than 21 ounces of dry arrow-root were taken daily, this would supply more carbon than is lost in the daily oxidation. The excess of carbon must either be deposited as fat, or must take away the oxygen, so as to leave none free to act on the nitrogenous substance that is passing out from the albuminous textures. Hence, with carbonaceous diet in excess, the whole of the uric acid from the tissues might pass off through the blood unoxidised.

It follows, then, that in gout a minimum of albuminous food should be taken in order to produce the least uric acid; and a minimum of carbonaceous food in order to allow the uric acid to be oxidised as much as possible.

If a pint of ordinary beef-tea, free from fat, contains 46 grains of nitrogen and 160 grains of carbon, and if an ounce of dry arrowroot contains 363 grains of carbon, then $3\frac{1}{2}$ pints of beef tea and 9 ounces of arrowroot will contain the full amount of elements that are required even in health for the system, and far less than this would be desirable when the minimum production of urates is required.

Secondly, as to air.

In oxygen the energy exists without which all our heat and all our power, and, indirectly, if not directly, all our growth would stop. The nitrogen of the air probably only dilutes the oxygen to the strength we can bear. Some experiments of M. Regnault's show that in less dilute oxygen more of this gas is not inhaled than in our atmosphere. M. Pettenkoffer will probably give us more accurate knowledge of this subject, and enable us to see the amount of intermediate oxidations going on within the body by comparing under natural condi-

tions the total amount of oxygen that goes in with the amount that comes out in the carbonic acid and water that are the products of the ultimate oxidation only.

The use or uselessness, in the treatment of gout, of the inhalation of oxygen and of ozone can be determined only by the most careful experiments. At present, voluntarily increased rapidity of respiration by exercise (blowing the fire, in other words) is likely to add more oxygen to the blood than strengthening the mixture of oxygen in the air.

The oppressive and debilitating effect produced by the respiration of air heated to the temperature of the blood proves that diluting the oxygen by expansion produces a very decided effect on the oxidising action in the body. The hotter the air, the less will be the amount of oxygen in a given space; and the colder the air, the more oxygen will the lungs obtain. Moreover, the diffusion of the gases in the vesicles and the bronchial tubes must be greatly influenced by the different temperatures of the different parts of the column of air. The purer the air, the less carbonic acid, and the less mineral, vegetable, and animal impurities will it contain in the form of dust. Any increase in the amount of carbonic acid in the inspired air produces a chemical impediment to the escape of carbonic acid from the blood, and the passage of smoke and dust into the air vesicles themselves mechanically interferes with the actions of solution and diffusion on which respiration depends.

When there is reaction, cold air (or cold water) promotes oxidation; but continued external cold directly or indirectly causes contraction of the vessels of the surface, and drives the blood within; and hence the greatest oxidation takes places by keeping the circulation free on the skin and extremities by the warmest possible clothing by enveloping the inflamed part in cotton and oil-silk, or in flannel.

Thirdly, on the action of medicines in promoting oxidation, elimination, and absorption. For indirectly promoting oxidation the two most potent medicines we posses are alkalies and iron.

Alkalies assist in the oxidation of organic substances, not by giving oxygen, but by promoting the formation of vegetable and animal acids, and ultimately forming carbonates out of the burning matter. Familiar instances are the saponification of fats, the use of caustic potash in Trommer's test for sugar, the use of lime in Moore's test; the use of potass in Liebig's method of determining the amount of oxygen gas by pyrogallic acid.

Hence caustic alkalies, potass, soda, magnesia, are more efficacious as oxidisers than carbonates, and carbonates more

potent than bicarbonates. But even bicarbonates, when heated with organic substances, lead to the formation of organic acids, which displace the carbonic acid, and thus promote the oxidising action. Thus diabetic sugar with sulphate of copper and carbonate or bicarbonate of potash in the cold gives no reduction, but when heated to 212° the reduction is evident. Ammonia is at least partly oxidised in passing through the system, and therefore it is of no avail in the treatment of gout as an oxidiser, though it may be used to neutralise acid in the stomach, or to act as a temporary stimulant.

Iron indirectly is an oxidiser, by its power of drawing oxygen into the blood. The great object of giving iron as medicine is the formation of blood-globules. For this hœmatoglobulin itself would probably be the best preparation, as being nearest in composition to the substance ultimately formed; but hitherto all attempts to prepare even hæmatin in quantity as a medicine have failed, and dried colouring matter of the blood is the simplest substitute. The reduced metal, the oxide, the carbonate, or some vegetable salts, are usually given, and all with good effect. The large amount of iron that passes off in the fæces and urine shows how little metal attains the intended object. In ten minutes I have found a solution of sulphate of iron passing out in the urine, and in twenty-four hours in the fæces. Hence very small doses of hæmatoglobulin would probably be equivalent to the large doses of other iron medicines which are given. In the active state of gout iron of any kind is inadmissible; in the passive state it becomes a most efficacious remedy.

All the salts of the organic acids that pass through the stomach into the blood, as, for example, the acetates, tartrates, citrates, are oxidised and pass into the urine and textures as carbonates; and hence all effervescing saline draughts may be considered as acting in the tissues as the carbonates of the alkalies act; that is, they promote the formation of organic acids in the textures; and these acids pass by the absorbents, and by the veins back into the blood, to be oxidised and thrown out by the urine and by the skin.

The mineral waters, reputed good for gout, are mostly dilute solutions of alkali—*e.g.*, Vichy water. Generally the stronger the water the more efficaciously it acts, but the action of the water itself must not be disregarded—*e.g.*, Buxton; the water diffuses not only into the urine, making that more dilute, but it dilutes the serum of the blood, and diffuses into the textures, dissolving deposited urates, and hindering fresh deposition of crystal. Thus water alone in sufficient quantity acts not only as a diuretic, but as a dialytic remedy, and in gout the action of the water of mineral waters might be still more exactly defined

as urilytic. The water takes the uric acid as urates from the textures and carries it to the blood to be oxidised, and thrown out as urea and carbonic acid

In the gouty deposits, however, there is another deposit—namely, fibrin, which is by no means soluble like the urates, for water and alkaline carbonates have but little action on deposited fibrin. How far iodine, bromine, and mercury possess the power of indirectly or directly oxidising fibrin has yet to be determined. In the present state of our knowledge, nitrate of potass is all of remedies the one which can pass most readily into the joints, and can exert a solvent action on the fibrin that may be deposited there.—*Med. Times and Gazette, May* 27, 1865, *p.* 530.

8.—ON THE GERMS OF RHEUMATIC FEVER.

By Dr. Horace Dobell, Physician to the Royal Infirmary for Diseases of the Chest.

[Cases of acid dyspepsia are seen every day. The symptoms are as follow :]

1. Pain at the epigastrium, coming on within an hour after food, generally within half an hour, very often within a few minutes, especially excited or aggravated by cheese or malt liquor.

2. Urine very acid, of high specific gravity, high coloured, and depositing urates on cooling, and uric acid crystals after standing some time ; often suddenly changing to limpid and low specific gravity, but quickly returning to the other condition.

3. Tongue red at the tip, with elevated papillæ ; often red at the edges also.

4. Appetite usually good, often very good, especially for animal food.

5. Epigastrium tender on pressure.

Such are the features of the majority of the cases, of course complicated and modified by the existence of other diseases, the habits of the patients, &c.

The most marked of these is the time at which pain begins after food ; it is very soon after. Sometimes we find an old neglected case in which the pain comes on later, even an hour and a half, or, rarely, two hours after food ; but if it be a case of acid dyspepsia, you will find, on close inquiry, that when the symptoms first set in, the pain was directly after eating ; and that the time of its onset has become later and later. In these cases, too, the appetite will be bad, instead of good ; and the food will often be vomited. They are, in fact, exceptional

cases, in which the digestive power has become paralysed by the neglect of the original disease. With these exceptions, if the pain does not begin till more than one hour after eating, the case is not one of acid dyspepsia. To demonstrate these exceptions, I may mention to you Case 64,297, domestic servant. She complained of pain in the pit of the stomach, beginning from one to two hours after food, with much flatulence; but said that when it began, five weeks before admission, it came on much sooner after food; and as the complaint yielded to treatment, the pain came on sooner and sooner after food, till it ceased to come at all. In Case 64,525, the food was brought up undigested; and in Case 64,207, there was no appetite and no taste for food on admission; but when the complaint began, two months before, the appetite was very good.

So much, then, for the symptoms of this complaint. The next point is as simple and as striking af the symptoms; viz., that the cases almost invariably get well in a few weeks under a very simple plan of treatment.

1. We order them to take out-of-door exercise, and to attend to the condition of the skin.

2. We forbid them to take malt liquor or cheese, and allow whisky or brandy instead; and advise water to be drunk freely.

3. We neutralise the secretions by soda and potass in full doses, with lemon juice or citric acid; then follow this with an alkaline stomachic powder of soda, potass, ginger and calumba before meals; and, if the patient be weak, give iron and quinine to finish. Sometimes we have to put a very small blister over the pit of the stomach, but not often. This alkaline plan of treatment must be thoroughly carried out: and it is surprising what large quantities of alkali are often required. If you find the symptoms obstinate, you will be sure to find that the secretions are still too acid: they must be completely neutralised at the onset; and then you will quickly find the tongue lose its red tip and edges, and there will be no more pain after food. This feature in the treatment brings me to the point upon which all the interest turns—the link which connects these common cases of acid dyspepsia with the cases of disease of the heart.

It lies in the fact that this acid dyspepsia is a symptom of a rheumatic state of the system. If you inquire into these cases carefully, you will discover in the majority a rheumatic history. You will find that they belong to rheumatic families, or that they have themselves been the subjects of rheumatic affections. This fact is illustrated by many cases now under treatment.

There is every reason to believe that the acid, which is found in such quantities in the stomachs of these patients, is either identical with or closely allied to the *materies morbi* of rheu-

matism—the acid which must exist in excess in the organism before a person can have rheumatic fever.

Whether it is first generated in, or poured into, the digestive tract, and afterwards absorbed into the blood, may be open to question; but, whatever be the exact order of events, it is quite certain from clinical observation, that it appears in the stomach very early in its career of mischief, and there gives rise to the symptoms of acid dyspepsia, which may, therefore, be taken as an important signal for alarm, never to be disregarded. It shows that the enemy is collecting his forces for an attack.

For this reason, as you may have observed, I seldom discharge patients who have been under treatment for acid dyspepsia without giving them directions for their future management, and the prescriptions of their alkaline medicines to be resorted to whenever they find the symptoms of their complaint returning. By adopting this plan, I have known many persons keep free from rheumatic fever and rheumatism for years who previously had been subject to periodic attacks at short intervals.

If you inquire into the histories of persons who are subject to rheumatic fever, you will find, as a general rule, that they frequently suffer from acid dyspepsia; and, if you inquire into the histories of persons subject to acid dyspepsia, you will generally be able to make out either that they have suffered from some rheumatic affections, or that they belong to rheumatic families. In these two sets of cases, then, which are so numerous at this infirmary, we see the two ends of a long and sad story. So far as I am aware, the connexion between them has never before been specially pointed out; but I believe that I cannot too strongly impress upon you the importance of bearing in mind, when you get into practice, the fact that acid dyspepsia and valvular disease of the heart are to be regarded as the germs and vestiges of rheumatic fever; and that, if you keep in check the acid dyspepsia, you will not have the rheumatic fever; and that thus you may prevent the occurrence of the valvular disease.—*British Medical Journal*, *March* 11, 1865, *p.* 240.

9.—ON THE BLISTER TREATMENT OF ACUTE RHEUMATISM.

By Dr. Herbert Davies, Finsbury Square.

The real questions appear to be simply these: Does the blister treatment remove the inflammation, pain, and swelling of the joints quickly and effectively?—Are relapses rare under the plan?—and further, Is the heart in the large majority of cases shielded from endocarditis and pericarditis by the method, fully and boldly carried out?

To all these points I can answer most distinctly in the affirmative, not only as the result of my own experience in hospital and private practice, but from the testimony of several who have adopted this plan of treatment. Thus Mr. Owen of Leatherhead says: "I have been so well pleased with the blister treatment of acute rheumatism that I have been induced to try it in subacute cases as well, and I may say with very decided benefit, but the relief experienced is not so striking. I have now treated about a dozen cases, and have found relief within twenty-four hours of the application; and, as a rule, have rarely had to use more than eight blisters." And he concludes by observing: "I do not think that I have had a single case of cardiac disease since using the treatment; and I may sum up by saying that if I had acute rheumatism to-morrow I would trust entirely to it."

Again, Dr. Duchesne, of Woodford, reports to me the case of a middle-aged man, a gardener, who suffered from agonizing pain in all his joints, acid urine, and all the usual symptoms of acute rheumatism. "I put on six blisters, and followed them up by linseed-meal poultices. No medicine. In ten days the man was out and at work. Much of the success in this case arose, I believe, from the fact that the patient was treated at an early stage of the disease."

The following case, under the care of Dr. Cory, of the Commercial-road, aptly illustrates the advantages of the treatment: —"I have just had a case in which your blister treatment has had a most marked and beneficial effect in the person of a foreman to a builder, exposed to various vicissitudes of temperature. He was attacked with violent rheumatic inflammation in one hand and wrist, and the ankles also were so tender and swollen that he was unable to bear them even touched. Having passed two wretched nights, in spite of a grain of morphia at bedtime, I resolved to try your system of blistering, which was proposed to my patient, who gladly gave his consent to any plan which would promise relief. Blisters were applied aronnd each ankle and wrist; relief was obtained in a few hours; and he slept soundly all night, awaking much refreshed. He had no more swelling or pain, no relapse or retrocession; and this morning he went to work, seven days after the application of the blisters."

Mr. Adams, of Lymington, Hants, has kindly sent me the following brief notes:—

"W. V., aged sixteen, had severe acute rheumatism of both knees; excessive pain and immobility; not much general fever, and no heart symptoms. Circular blisters of about three inches in width were applied above and below the joints. Next day almost all the pain gone. The wrist and elbow were now

attacked in a similar manner. Blisters were applied above the wrist and above and below the elbow. All pains had ceased on the following day. The knees were stiff and weak for a few days; but in less than a fortnight from the commencement of his illness he had returned to work. The only medicine taken was an aperient dose."

I might quote other accounts given me of the success of the plan in private practice; but a sufficient number of cases has been already laid before the profession to entitle the treatment, I believe, to its full consideration. In answer to the question as to the greatest number of blisters I have had to apply at one time in private practice, I cannot remember as many as ten being simultaneously required; but I have had several most successful cases where five, six, eight blisters have been at one time used, and by a little tact and explanation I have rarely had any difficulty in persuading my patients to allow of their application. The slightest reference on my part to the great probability of the heart being saved by this plan has almost invariably induced an eager consent to the employment of the blisters. And I may further add that neither in hospital nor in private practice have I ever heard any serious complaint of the severity of the treatment; on the contrary, in the pamphlet which I have published on the subject will be found many instances where the patients expressed great satisfaction at the rapid and lasting relief which the blisters afforded. In some cases the "pains began to leave the inflamed joints as soon as the blisters began to draw," and in one case the patient said that "he would prefer to have forty blisters applied than undergo the agony of rheumatic fever." The same was the result in the majority of the cases treated on this plan by Dr. Jeaffreson in St. Bartholomew's Hospital. Using the words of the editor, "Reduced temperature, slower pulse, less acid urine, sleep and appetite, are the happy train of symptoms which follow hard on extensive vesication. In most of these cases the reports would lead us to think that the patients were quickly relieved by the blisters."

I can only add that the above are facts, the result of daily and most careful observation; and I would say further, that in no single instance have I seen any unusual "weakness of convalescence" or "slow healing from blistered surfaces." As to the time during which the cases reported were in the hospital, it will be observed from my pamphlet that many were discharged under three weeks, and that some remained in the wards for four, five, or six weeks. These latter cases were individuals of feeble constitution, who had been over-worked and under-fed, who would have recovered their general tone but slowly after any malady, and who required rest, food, and

shelter from inclement weather for some time previous to their resuming their ordinary occupations.

I have already trespassed at some length upon your valuable columns, otherwise I should have been inclined to make some remarks upon the alkaline treatment of rheumatic fever. I will only quote from my paper the following statement :—"That the blister and alkaline treatments are not incompatible with each other; and I believe a *mild* course of alkali to be a useful adjunct to the directly-eliminative blister plan, but not essential, except in those cases where the rheumatic virus attacks the heart in the first instance and appears to hesitate in fixing itself upon the joints." My object in publishing the results of the plan in fifty cases was to prove that the local treatment, fully and efficiently carried out, is all-sufficient in the very large majority of cases to remove the disease rapidly and safely, and without necessitating the internal employment of such large doses of alkali which, while undoubtedly tending to counteract the acid *materies morbi*, considerably impair for some time the general health and tone of the constitution of the patient.

The blister plan acts quickly, decisively, and to the point: at once throwing out the poison, diminishing the temperature of the body, restoring the urine to its normal reaction, and, without interfering in any way with the digestive powers of the alimentary canal, rapidly allows of the return of the appetite. Such a result is cheaply bought at the expense of a little pain.—*Lancet, August* 19, 1865, *p.* 213.

DISEASES OF THE NERVOUS SYSTEM.

10.—CASES OF REFLEX PARALYSIS, WITH OBSERVATIONS.

By Dr. Alexander Robertson, Physician to the Town's Hospital and City Parochial Lunatic Asylum, Glasgow.

[An important group of so-called functional derangements is believed to have its origin in some peripheral excitation. There are not wanting pathologists, however, who maintain that they should be classified with the organic forms. A strong reason, however, for believing that the central lesion, if any, is slight, is the fact that recovery speedily follows the removal of the irritating cause.]

The first of the two cases that I have to submit illustrates one of the rarest forms of derangement of the central nervous system—reflex hemiplegia. I shall shortly narrate the history and leading symptoms.

On the 16th of last November, about 8 a.m., I was called hurriedly to see J. C., an hospital sick nurse, who was reported

to have been seized with a shock of palsy. I was rather surprised at this message, as the woman was not old, forty-one, and, although delicate looking, had certainly not the aspect of one disposed to apoplexy. Besides she had been attending to her duty the day before, and made no complaint. I found her in bed, quite calm, and intelligent as usual, ready to answer all my questions, which she did with promptitude, and manifested not the least mental confusion or excitement. She told me that when a child of about seven or eight years of age she took "nervous fits" three or four times a-day for three years; that afterwards she got quite well, but since then has been of a nervous disposition. About ten months since became affected with giddiness and ringing in the ears, and one morning was seized with numbness of the left side, which troubled her for about two months, when she recovered completely: but the latter symptom returned for a few days in the month of May, again leaving her in her ordinary health. For several years has occasionally suffered from severe pain in the left hip, extending down as far as the knee, which was aggravated on both of the occasions referred to. Believes that this pain is connected with constipation of the bowels, as she always experiences relief when they are free. About eight days ago, and she thinks owing to anxiety about her family, she had a return of the symptoms, especially of the numbness of the side; but they were not so severe as to unfit her for her work. However, at 1 o'clock this morning the pain in her left haunch, which had been annoying her a good deal for some days, became excruciating, and, as before, extending down the back of the thigh as far as the knee. At the same time she felt that she had partially lost the power of the left arm and leg. Suffered severely all night; but, about an hour since, at her own request, another nurse gave her a soap and water injection, clearing out a quantity of impacted fæcal matter; and in three minutes she was almost free from the pain in the thigh. Says that now the numbness continues, and affects also the same side of the face. Cannot hold small articles, such as a needle, in her hand; the sense of touch, however, when tested by compasses, is not much impaired as contrasted with the opposite side. Feels the left side colder than the right, though no difference is observable. Has no other abnormal sensation. Retains some power of grasping with the left hand, but it is decidedly weaker; can move the leg in bed in all directions, though not so freely as usual; and when she tries to walk she drags it after her. Has full power of bladder, and has been passing a moderate quantity of healthy urine. Sight of both eyes, particularly the left, is impaired; but this is not recent, as it has been ailing for some years Considers it is due to constant sewing, by which she earned her livelihood

before she became nurse; pupils are natural. The other special senses are in their normal condition, and so also is the power of swallowing. There is no distortion of the face nor impairment of speech; protrudes tongue correctly. Menstrual discharge is not now flowing, but has been seldom free from it during the last three months. Heart sounds natural; pulse 100, small and soft. Tongue is clean, but is troubled with flatulence, and has a poor appetite. Is of a nervous temperament, but possesses considerable vigour of mind, and is not easily excited. The bowels were acted on freely, and afterwards had a draught of tr. assafœtida and tr. valerian ammon., of each ℥ss., in mist. camphor ℥j., every four hours.

On the 18th, the third day after the seizure, the report bears that she had greatly improved, and was attending to her duty, being able to walk nearly quite well, though not free from numbness of the left side. Prescribed tr. ferri. muriat., gtt. xv.; quinæ sulphat., gr. j., thrice daily, with full diet. From this time her recovery continued, and she acted as nurse till she left the establishment about six weeks afterwards.

She called at the hospital in the beginning of April, when she told me that she had been working regularly at her employment as a seamstress since she left, and had continued free from paralytic symptoms, except on several occasions after an unusually hard day's work, when the numbness and loss of power returned in a slight degree, but passed away after a few hour's rest. She incidentally mentioned that when she had the serious attacks above described, an intensely itching eruption had broken out on her head, which lasted about a week, and produced an unusual quantity of scabs during its continuance; she also remarked that the left side of her face had often been swelled a little without any cause that she knew of, and was quite sure that the right had never been affected in the same way.

Remarks.—Here, then, we have severe sciatica arising at intervals from a recognised cause,—impaction of the lower bowel; but on the last occasion the morbid impression produced on the lower part of the spinal cord had been very severe, and the woman's system, naturally a susceptible one, was more than ordinarily so, owing to her mental anxiety, and the drain on her vital powers from the prolonged menstrual flux; hence, probably the reason why the impression was transmitted upwards along the cord to the medulla oblongata, producing a partial hemiplegia, which like the sciatica, was confined to the left side. The effects of the treatment pursued support this view of the case; for instant relief from the pain was experienced, and paralysis quickly passed away after the removal of the apparent exciting cause of both—the impaction of the bowel.

It may be suggested that some of the symptoms indicated hysteria; and that the case might be classed under the hysterical hemiplegia described by the late Dr. Todd in his lectures on paralysis. But the leading features of that disease were wanting; and besides, some cases of palsy which have been held to be of this nature would probably have been more correctly viewed as reflex in their origin. The eruption on the scalp, attended by increased exudation, and the fulness of the left side of the face, are very interesting, as they indicate that the paralysing influence had produced a decided impression on the trunk of the cervical sympathetic. It is also worthy of notice that the anæsthesia was more pronounced than is usual in this kind of paralysis, as not infrequently sensation is unimpaired.

I have now to record a case of paraplegia arising from an eccentric cause.

J. R., aged thirty, clerk, admitted May 22, 1864. Nearly two years ago was convicted of embezzlement, and was sentenced to eighteen months' imprisonment. When he had completed about ten months of his term, his health began to give way,—he got nervous, slept indifferently at night, his appetite became weak, and he began to pass small worms in his stools, which have troubled him ever since. Though he has ordered a generous diet, with metallic tonics, cod liver oil, &c., and had local treatment for the worms, he did not improve in any respect. About three or four months since felt his legs becoming very weak, much more so than his arms; and when his period of confinement had expired, a fortnight ago, this weakness had increased so much that he was unable to walk above a few steps at a time. About a month after he began to lose the power of his legs he noticed that he could not pass his urine with the same freedom as before. Since then this difficulty has varied much in degree, being sometimes much less than at others; but latterly it has increased so much that at present he has completely lost the power of his bladder, and has passed no water since yesterday. Is an intelligent, well-informed man; and gave a clear statement of his symptoms. Has a pale, nervous, depressed aspect; complains of dull headache, and says he has been subject to it during his confinement. Special senses are correct; and pupils though rather open, contract readily under light. Motor and sensory power of the upper extremities and body generally are and have been unaffected. Has no pain in back. Sensation is perfect in lower extremities; and can also walk some steps, but very soon gait becomes tottering. Is not subject to starting of his legs, nor can reflex movements be produced by tickling. Complains of great itching about anus and scrotum. Pulse only 52; skin rather cold. Urine had to be drawn off for several days by the catheter; but then he became

able to pass it himself, though slowly and with difficulty. Was ordered full diet; to take twice daily a pill containing strychniæ, gr. $\frac{1}{20}$; ferri sulphat., quinæ sulphat., āā gr. j.; extr. aloes, aq., gr. $1\frac{1}{2}$. To have an enema twice a-week of tr. ferri muriat, ℥ij.; aq. calcis, ℥viii. Cold douche to spine, and surface afterwards to be thoroughly rubbed. The continuous galvanic current was also passed repeatedly between the lower part of spine and the hypogastrium. Under this treatment he improved; but there was great variation in his progress to recovery. Thus on June 8, I find recorded in my note-book, "That his urine had again to be drawn off by the catheter, though he had been passing it himself for some days previously. Itching at anus is very troublesome." Again on the 24th of the same month, the entry is:—"Bladder and legs have recovered their power to a great extent; but the stools are not yet free from thread-worms, though they are fewer, and the itching is much less." From this date he progressed favourably; and on August 2 he was dismissed cured. His condition on dismissal is reported as follows:—"Worms are now quite away. Has been walking about for some weeks, and feels strong on his legs. Bladder has recovered its tone; but has a feeling of heat in urethra when he passes urine. Is returning to his occupation as a clerk."

Remarks.—This is a characteristic case of reflex paralysis. 1st. There is the obvious cause, the ascarides in the rectum, existing for some months before the paralytic symptoms set in. 2nd. The incomplete loss of power, and the variation in its degree corresponding very much with the varying intensity of the local irritation. 3rd. There was no anæsthesia; and there was an absence of abnormal sensations in his legs. 4th. There was no pain in the course of the spine. 5th. It passed away entirely as soon as the disease upon which it depended was cured. 6th. One peculiarity is to be noticed:—The bladder was more than usually affected; but the paralysis differed materially in its character from that arising from ordinary organic causes; as, though complete on several occasions, it was not continuous, but recurrent; and generally it was only partial. —*Med. Times and Gazette, May* 27, 1865, *p.* 544.

11.—ON THE TREATMENT OF CERTAIN FORMS OF PARALYSIS BY GALVANIZATION AND FARADIZATION.

By Dr. Julius Althaus, Physician to the Royal Infirmary for Diseases for the Chest, London.

[There are only two forms of current required for therapeutic purposes, viz., the induced or interrupted electro-magnetic, and the continuous galvanic current, the methodical employment

of which has been termed respectively "faradization and galvanization." Frictional electricity possesses no peculiar advantages, while the magneto-electric current is decidedly inferior to the electro-magnetic.]

The double-current induction machine, and the modification of Daniell's battery, both constructed according to my directions by Mr. Becker, of the firm of Messrs. Elliott Brothers, of St. Martin's-lane and the Strand, are sufficient for all practical purposes. The former of these apparatuses is similar to the induction machines which are now in general use on the continent; whilst the constant battery just mentioned is, for beauty and efficiency of arrangement, superior to any that have hitherto been contrived. In those constant batteries which have until now been used by medical men, the great drawback has been the presence either of nitric, sulphuric, or chromic acids, which not only after a time destroy the battery, but also entail considerable variations in the power of the current, and much loss of time on the part of the operator. It was therefore desirable, in the construction of a battery suited for medical practice, to dispense with acids altogether, in order to render the current as constant as possible, and to avoid inconvenience and loss of time. For these reasons the machine mentioned is only charged with water and a solution of sulphate of copper, with the result that after having been once put into action a constant current is obtained, which continues reliable for about six months, even if the battery is daily used. No acid being present, the cast zinc cannot be destroyed, and remains quite unchanged. After the lapse of the period mentioned, the deposit of copper must be removed from the zinc plates, and a fresh solution of sulphate of copper be substituted. If this be occasionally repeated, the battery will last for any length of time; while most constant batteries, when daily used, are destroyed in about a twelvemonth, and some even in so short a space as six weeks. Another advantage of the absence of acid in this battery is, that the current gains in quantity while it loses in tension, and can on this account be safely used for acting on the centres of the nervous system.

The physical relations and the chemical and physiological effects of the continuous and the interrupted current are widely different from one another; and it may therefore be inferred that each one of them has also its own special sphere of action in therapeutics. The continuous current, which is produced by the chemical action of two heterogeneous conducting bodies, moves always in the same direction, and has considerable chemical effects; as it easily decomposes water and saline solutions, oxygen and acids being attracted to the positive pole,

while hydrogen and alkalies accumulate at the negative pole. Induction currents, on the contrary, are of instantaneous duration, move alternately in contrary directions, and have therefore only a slight chemical action; for, as each wire serves alternately as positive and negative pole, their chemical effects are, in a great measure, neutralized as soon as produced. As regards the difference in the physiological action of the two currents, it may be laid down as a fundamental principle, that *the induced current only acts on the parts directly submitted to its influence, unless a very high power be used; while the continuous current, by reflex action, also affects distant parts, and more especially the centres of the nervous system.* As this is a new proposition, it will be necessary to adduce proofs in order to establish its correctness.

If the induced current is, by moistened conductors, applied to the face, it causes a peculiar sensation and contraction of the muscles; while the continuous current, if applied in the same manner, not only causes a peculiar sensation, and a contraction of the muscles both at its commencement and at its cessation, but also a vivid flash of light; and if the current be one of some force, even sickness, giddiness, and fainting may ensue. These latter phenomena, which are caused at whatever part of the face or nape of the neck the current may have been applied, can only be explained by assuming the physiological transmission of part of the current to the encephalon. There are also facts to prove that the continuous current has a physiological action on the spinal cord and the sympathetic nerve, if applied to the skin of the back by moistened conductors. Thus we may often cause the iris to contract by directing a current of large quantity to the lower cervical and upper dorsal vertebræ, showing that there is physiological transmission of part of the current to the cilio-spinal region of the cord and the corresponding ganglia of the sympathetic, which preside over the functions of the iris. Again, by applying a continuous current to the lumbar portion of the spine, we may cause a glow in the legs and feet, without any direct application to these latter, showing that the influence on animal temperature, which M. Claude Bernard and Dr. Brown-Séquard have proved to belong to the sympathetic, is brought into play by the application of the continuous current. These facts would appear sufficient to establish the correctness of the proposition with which I started—viz., that the continuous current is capable of influencing, by reflex action, the centres of the nervous system, both cerebro-spinal and sympathetic; while the induced or interrupted current has no distant, but only local and immediate effects.

The therapeutical experience I have gained in various forms of paralysis with both kinds of current, entirely coincides with

these physiological premises. It is to the effect that the interrupted current proves useful in local paralysis, due to injury of the motor nerves and muscles, to pressure, rheumatic effusions, poisoning by lead, &c., but can have a beneficial influence in paralysis from diseases of the nervous centres only after the original lesion has subsided, and in reflex paralysis only after the irritation in the spinal cord has passed off. The continuous current, on the other hand, proves efficient in certain forms of paralysis due to affections of the nervous centres, more especially in those cases which are caused by effusion in the spinal canal and incipient softening of the cord, as well as in most instances of reflex paralysis where irritation of the cord is still present.

[The author illustrates the therapeutical use of Galvanization and Faradization in paralytic diseases, by a short series of cases which have been under his care in private and hospital practice.]

I. Faradization.

1. *Cerebral Paralysis.*—Faradisation is useful in cases of hemiplegia after the complete formation of the apoplectic cyst, when there is no longer any irritation within the cranium; where the speech is little or not affected; where there is not much, or no muscular rigidity, but where the arm and leg remain nearly, or entirely, useless.

Case.—A gentleman, aged forty-five, had an attack of hemiplegia of the right side in June, 1863. I was consulted in April, 1864, when there was complete loss of power in the arm, and able to walk a short distance with the aid of another person's arm. only slight recovery of power in the leg, the patient being just Articulation satisfactory; no rigidity; nutrition in paralysed limbs much below par. Faradization for six weeks, after which the patient could write, dress, and feed himself, and walk a couple of miles, with the aid of a stick, without much inconvenience.

2. *Paralysis of the Portio Dura.*—Where this is due to rheumatic effusions in the sheath of the facial portion of the nerve, or in the muscles themselves, faradization is a very certain remedy, more especially where the contractility of the muscles is lost or diminished. On the contrary, where the intra-cranial portion of the nerve is suffering, a continuous current of low tension (from five to fifteen cells of the battery previously described) proves more useful. This latter often causes contractions of the muscles where a powerfully induced current fails to do so.

Case.—A lady, aged forty-two, was affected with left facial paralysis in January, 1862. She consulted me four months

after the commencement of the affection, when the only muscles which had recovered their tone, to a certain extent, were the frontal and corrugator; but all others were still completely paralysed. Uvula straight; no deafness. Faradization for a fortnight. Improvement after the first operation. Cure at the end of the second week.

I have treated a number of cases of intra-cranial paralysis of the portio dura by the aid of the continuous current; but as in every one of them other active remedies were administered at the same time, I will not give any particulars, but merely say that there was no doubt about the beneficial effect of galvanization in these cases, not only with regard to the gradual recovery of power, but also to the relief of pain, which is scarcely ever absent.

3. *Rheumatic Paralysis.*—Cases of loss of power in the extremities, arising from exposure to damp and cold, even if of a severe kind and of long standing, are generally cured by faradization, which also relieves the muscular pains, which are sometimes very severe.

Case.—A gentleman, aged thirty-seven, having been much given to fishing and hunting, suffered for three years from great pain and loss of power in the upper as well as the lower extremities, which he himself attributes to continual exposure to the weather. I saw him in October. 1858, when there was much wasting of muscular tissue, especially in the right deltoid and the extensors on the back of the forearm. No signs of central disease. The urine has been very thick, but is now normal. After five weeks' faradization the patient recovered.

4. *Paralysis from Pressure on Nervous Plexuses.*—Cases of loss of power from continued pressure, especially of the head on the arm during intoxication either by chloroform or alcohol, are generally curable by faradization.

Case.—A lady, aged twenty-three, had her first confinement in November, 1864, during which she was for some time under the influence of chloroform. While in this condition her head rested heavily on the left arm, and pressed so much on the brachial plexus that a number of muscles animated by the latter became entirely paralysed, there being also complete anæsthesia of the left arm. I saw her in January, 1865. The affection was most severe in the muscles of the forearm, the patient being quite unable to lift the wrist, which was much swollen, and had to be bound up with a splint. As she also complained of great weakness in the other limbs and the back, I combined the use of a continuous current of fifty cells to the spine, with faradization of the left shoulder and arm. After six weeks of this treatment, the patient felt very much stronger generally, and had entirely recovered the use of the left arm.

5. *Paralysis from Interrupted Continuity between the Spinal Cord and Motor Nerves (Dr. Marshall Hall's Spinal Paralysis.)*—Where the connexion of motor nerves with the spinal cord has, by external violence, been interrupted, a period varying from six to twelve months is required for re-establishing nervous conduction. The two cases recently published by MM. Nélaton and Laugier, which would seem to throw doubts on this point, are, in my opinion, not sufficient to make us give up the above proposition, which has been deduced from most careful clinical observation of a very large number of cases, as well as from physiological experiments on animals. Experience shows that faradization soon or immediately after such accidents is useless, and does not even prevent atrophy of the muscles deprived of their connexion with the cord. On the contrary if resorted to from six to twelve months after the accident, faradization frequently restores the power to the paralysed muscles.

Case.—A porter, aged thirty-two, suffered compound fracture of the right arm and other injuries from being run over by a van in December, 1860. After three months the fracture was healed but the arm remained useless. He was sent to me in May, 1861, when I found complete anæsthesia, paralysis, atrophy, and loss of electric contractility of the muscles from the acromion downwards. I recommended him to do nothing for three months, and then to present himself again. This he did in the October following, when he appeared to be much in the same condition. I then commenced the faradic treatment, and after about four months, the patient attending every other day, he had to a great extent recovered the use of the arm, although it was still much weaker than previous to the accident.

6. *Reflex Paralysis.*—In cases of this kind faradization proves beneficial after the irritation which, by its transmission to the spinal cord, caused the paralysis has subsided, but where paralysis nevertheless continues. In other cases faradization or galvanization may remove the irritation, and thus prove curative. For cases see my work on Paralysis, Neuralgia, &c., pp. 155–158.

7. *Hysterical Paralysis.*—Where this affection occurs in only one limb, or a particular set of muscles, faradization of the suffering parts is of use; but where it appears in the form of hemiplegia, paraplegia, or general paralysis, galvanization of the nervous centres is more effectual. (See a case of this description in the Lancet for Feb. 18th, 1865, p. 175.)

8. *Lead-Palsy.*—In paralysis from poisoning by lead, good results are generally obtained by faradization, even in severe cases, and after muscular atrophy has set in.

Case.—A painter, aged thirty-three, had for more than a

twelvemonth suffered from weakness of sight, colics, and dropping of both wrists. He had had a long course of iodide of potassium, under which he some what improved, but not one of the symptoms was entirely removed. I saw him in November, 1864, and treated him by galvanization of the optic nerve and abdomen, and faradization of the suffering muscles. Within a month he was so much improved that he could be discharged.

9. *Progressive Muscular Atrophy.*—There are two forms of this disease—viz., the partial, which begins in the hand or the shoulder, and does not affect any muscles but those of the upper extremities; and the general form, which may destroy nearly all the voluntary muscles throughout the body, and is mostly fatal. Cases of the former affection are curable by faradization; and such of the latter kind may be considerably improved, and their course be arrested, by a combined use of faradization of the muscles and galvanization of the nervous centres, if resorted to at an early stage of the disorder.

Case.—A gardener aged twenty-five, became, in consequence of overwork, very weak and lost flesh in the right arm and shoulder, in August, 1863. During the following two months the affection spread to the forearm and hand, and he was then quite unable to follow his employment. He was sent to me in December, 1863, when I found atrophy of most of the muscles of the right upper extremity. Faradization for nearly five months, after which the power of the muscles had so much increased that the patient could return to his occupation.

10. *Paralysis of the Vocal Cords.*—As Dr. Morell Mackenzie has lately published a number of cases of aphonia due to a paralytic condition of the vocal cords, and successfully treated by faradization, I will only say that my experience in this particular quite agrees with that of Dr. Mackenzie.

II. Galvanization.

1. *Cerebral Paralysis.*—In certain cases of cerebral paralysis with intra-cranial irritation, a cautious use of the continuous galvanic current proves of decided benefit, in allaying pain, spasms, and muscular rigidity. I abstain from giving cases of this description, as in every one of them which have fallen under my notice other remedies were administered at the same time. The continuous current is likewise useful in cases without pain and spasm, but where the speech is much affected and the paralysis of arm and leg continues; and it can be safely employed about six months after a seizure.

2. *Ptosis, Double Vision, and other Paralytic Affections of the Third, Fourth, and Sixth Nerve, and of the Iris.*—In these conditions, even if they are caused by encephalic disease, the con-

tinuous current, cautiously and gently applied, may produce very striking results. For the majority of such cases, five or ten cells of the battery are quite sufficient, and the operations must be very short; for long and strong applications only do harm. An able and elaborate paper on this subject, by Dr. Benedikt of Vienna, may be found in Von Graefe's "Archiv für Ophthalmologie," 1864, vol. x., part i., p. 97.

Cases.—A gentleman, aged forty-nine, had for ten months suffered from ptosis of the left eyelid, for which he had undergone a variety of treatment without benefit when he consulted me in Dec. 1864. There were many other symptoms exciting the suspicion of encephalic disease. Galvanization by five cells, for not more than half a minute each time. Within a fortnight he had recovered the power over the eyelid, although there was no improvement in the other symptoms.

A lady, aged forty-five, suffered from mydriasis of the right eye. She was otherwise in good health, and unable to account for this affection. She was sent to me in July, 1862. Galvanization by three cells of Bunsen's battery, with immediate improvement during the first operation. She left town after four operations, much improved.

3. *Incipient and Progressive Softening of the Spinal Cord.*—In this affection good results may be obtained by the application of a powerful continuous current, of from fifty to a hundred cells of Daniell's battery, to the spine. Such operations, when judiciously performed, evidently exercise a direct influence on the nutrition of nervous matter. In the late stages of the disorder—that is, where actual destruction of nervous matter has taken place—of course no benefit can be obtained.

Case.—A commercial traveller, aged thirty-eight, felt pins and needles in the feet, and loss of power in the back and the lower extremities, in March, 1864. I was consulted in October last, when there was tottering gait, loss of sensation in back and legs, difficulty in passing urine, costiveness, and the other symptoms of softening. Galvanization by from eighty to a hundred cells, ten minutes each time, for two months. Remarkable improvement in every respect, so that the patient was able to return to his avocation.—*Lancet, Aug.* 12, *and Sept.* 2, 1865, *pp.* 178, 259.

12.—ON PROGRESSIVE LOCOMOTOR ATAXY.

By Dr. C. B. Radcliffe, Physician to the Westminster Hospital, and to the National Hospital for Paralysis and Epilepsy, &c.

This malady was discovered seven or eight years ago by M. Duchenne (de Boulogne), and described under the name of

ataxie locomotrice progressive. In it there is no deficient action of the will upon the muscles individually, and no loss of muscular force or change of muscular structure; but there is deficient action in that involuntary instinctive co-ordinating power by which various groups of muscles are made to work harmoniously together in such act as standing, walking, or handling. The term ataxy (α, privative, and ταξις, order), which has referance to the deficiency in proper co-ordinating power, is not very fortunate, for the adjective *ataxic* is very commonly used in a different sense, as in ataxic fever, where what is meant is low fever in which nervous exhaustion is the predominant condition. To meet this difficulty other names have been suggested; but *the* satisfactory name has yet to be found, and for the present, therefore, we must be content to use the one employed originally, and call the disease in question ataxie locomotrice progressive, or progressive locomotor ataxy, or ataxy simply.

Until M. Duchenne (de Boulogne) drew attention to it, ataxy was confounded with spinal paralysis in general, and especially with that vague form of this paralysis which is known under the name of *tabes dorsalis.* The disorderly movements of the muscles were regarded as symptoms of paralysis. It was not perceived that the muscles in which these disorderly movements were manifested were healthy, and behaved well in all respects except when they were called upon to act in concert. Moreover, it was not known that this loss of co-ordinating muscular power simply was associated with other symptoms in a definite category. In a word, to M. Duchenne (de Boulogne) must undoubtedly be ascribed the honour which belongs to him who discovers a disease, sufficiently definite in its characters, which had been confounded previously with other and very dissimilar diseases.

The case which serves me for a text is now in the wards. It is that of J. C., a sailor, thirty-four years of age, living at Islington, and admitted into the National Hospital for Paralysis and Epilepsy on the 3rd of April, 1865. The notes I have run thus:—

Present Condition.—J. C., is a man somewhat under the average height and weight, well-proportioned, well-developed as to muscle, especially in the upper parts of the body, with scarcely any subcutaneous fat, with abundance of brown hair on the head and face, and with a complexion much dried and browned by long exposure to sun and sea.

He is capable of walking without a stick, but his gait is peculiar—staggering, precipitate, the legs thrown about vaguely and spasmodically, and the heel brought down with force at each step. With his eyes shut, or in the dark, he reels over

at once, and would fall helplessly unless prevented from doing so. In the sitting posture he can lift either leg steadily into any position, and keep it there, and when the leg is put out in this manner, he can keep it extended in spite of a very strong effort on my part to flex it. In order to this, however, he must see what he is doing, for if his eyes are shut the leg at once becomes unsteady, and little force comparatively is required to bend it. The right leg is a little weaker than the left, but not to any very considerable degree. He finds it very difficult to come down-stairs, or to quicken his pace much, and he is speedily fatigued by the acts of standing or walking. On being told to shut his eyes, and touch his nose with the fore-finger of each hand in turn, he did so with tolerable accuracy, especially with the forefinger of the left hand. On being told to stretch out his arms, and keep them out, he did so quite well, but only so long as he was allowed to see what he was doing, for on holding a book before his eyes, his arms, shoulders, neck and head—the upper part of his body generally—at once become affected with convulsive titubation. When the book was taken away these movements speedily came to an end, but not before they had issued in a fit of crying and sobbing, which was not a little distressing to witness. This fit took the patient quite by surprise, and it could not be accounted for by the examination having been conducted roughly, or carried on for an undue length of time; indeed, the holding of the book before the eyes, which was its immediate cause, did not occupy more than a minute at the most.

The muscles of the lower limbs generally are less developed than those of the upper limbs and trunk, but there is no appearance of wasting in them. Their electro-contractility is perfect; they stand out firm and hard when made to contract by the will, and the contraction seems every whit as strong as it ought to be. Indeed, as has been stated already, when the leg is put out and stiffened, it is not in my power to bend it against the will of the patient, except by the exercise of great force. There is no tremulousness anywhere; and no marked reflex movements are produced by tickling the soles of the feet.

What the patient complains of chiefly are excruciating, stabbing, boring, nipping pangs of pain, flitting from one spot to another in a very erratic manner, in paroxysms lasting from a few minutes to twelve, twenty-four, or forty-eight hours; and generally fixing upon one spot only in any single paroxysm. These pangs are most frequently felt in the two feet, especially about the outer side of the metatarsal bone of the little toe; they are also felt not unfrequently at the back of the thighs, in the nates, and in the upper arm about the lower part of the belly of the biceps. They are scarcely ever absent, especially

at night; at night, too, there is often a sensation of great coldness, with some degree of constriction, in the painful parts.

Measured by the compasses, tactile sensibility is found to be much impaired in the feet (especially in the soles), in the lower halves of both legs, and to some degree also in the back of the thighs, in the nates, and in the palms of the hands. The ground is felt very obscurely, but so far as it is felt the sensations are accurate—that is to say, it does not seem to the patient as if there were elastic cushions, pebbles, or other imaginary bodies, or as if there was nothing at all, under the feet.

Very rough pinching is scarcely at all felt in the benumbed parts, but elsewhere the sensibility to painful impressions is keen enough.

In the benumbed parts also, and in a lesser degree in some other parts, muscular sensibility (and with it probably the proper sensibility of the joints and bones) is manifestly diminished. In bed, for example, when there is no light, J. C. says that he cannot clearly tell where his feet are, and that not unfrequently his legs get quite out of bed without his knowledge. There is also very little feeling of pressure when the muscles of the feet and legs are squeezed with considerable force; and in the arms, as well as in the legs, the faculty of measuring and adjusting the amount of muscular action necessary for any given act is evidently not as much alive as it should be. For instance, when two weights are placed in his hand one after the other, one of them being at least a pound heavier than the other, he finds it difficult to say with certainty which is the heaviest of the two.

The sight of each eye is defective, and glasses afford no relief. The pupils are equal in size, and respond fairly to the light. The conjunctivæ are injected. There is no arcus senilis. There is no squinting or ptosis.

The hearing of each ear is so dull as to make it necessary to speak in a very loud tone in order to be heard. There are also constant singing and booming noises in the ears—"almost like the wind in the shrouds," he says.

The memory is bad, the spirits are very despondent, the head generally "feels very heavy," and of late (this statement is volunteered by the patient) there has been a frequent temptation to commit suicide.

The pulse is feeble, and about 70 in the minute. The appetite is good. The bowels are somewhat constipated. In any case a long time is spent over a stool: "it wont come out," is the patient's own description of the trouble in this quarter. The urine is also voided slowly and with difficulty, although the urethra is free from stricture; and now and then it escapes in

bed at night. Sexually, the state may be spoken of as approaching to, if not amounting to, spermatorrhœa.

Previous History.—Five years ago J. C., it appears, began to suffer from pains in the legs and back, and to be unsteady in his gait; about the same time, also, his sight and hearing began to fail; and from that time to this he has continued to get gradually worse and worse. Four years ago he had a sunstroke in the West Indies, of which the immediate symptoms were violent agitation and shaking, without loss of consciousness, and for which he was taken into an hospital and bled; but this accident was twelve months *after* his present malady had commenced, and therefore, it is not possible to look upon it as a cause of this malady.

C— was at sea seventeen years in all, chiefly in hot climates, as the West Indies and West Coast of Africa, and he continued at sea three years after he had begun to suffer from unsteadiness of gait and from the other symptoms which have just been mentioned. Once during the time he was at sea he had chancres, without secondary symptoms; and repeatedly he had diarrhœa; but, with these exceptions, his health on all occasions appears to have been very good. He says that he was always very careless, often sleeping almost without clothes upon the bare deck or upon the ground; and that he was always "too much given to drink and women." For the last two years the sexual power has been much damped; but before this time, according to his own showing he appears to have been little better than a very satyr. Two years ago, when obliged to abandon his calling as a sailor, he was for a while treated in the hospital at Quebec for rheumatism. Afterwards he found his way to this country, and became an out-patient first at one hospital and then at another. During this time he appears to have been frequently blistered along the spine, and on one occasion to have been salivated. For the rest I have only to add that his father died early in life of consumption; that his mother died young from some unknown chronic disease; and that a brother, the only member of the family besides himself, is now dying of the disease which proved fatal to his father.

M. Duchenne, whose description is the best as well as the first, marks out three stages in the course of the malady of which this case is an example. In the first stage, the patient suffers from paralysis, often temporary only, of one or other of the motor nerves of the eye, from some degree of amaurosis, usually accompanied by unequal pupils, and from the peculiar boring erratic pangs of pains from which C. suffered. In the second stage, in addition to the symptoms of the first stage, the characteristic unsteadiness of gait begins to show itself, together with diminished sensibility to touch and pain in the

skin of the lower parts of the legs, in the skin of the soles of the feet especially, the interval between the first stage and the second varying in length from a few months to several years. In the third stage the malady becomes more profound and general, the disorder in involuntary co-ordinate movement increasing in the legs, and extending to the upper parts of the body, the anæsthesia increasing in the parts first affected, and extending to other parts, not of the skin only, but even to the muscles, joints, and bones. M. Duchenne does not consider the affections of the bladder, the rectum, and the genital apparatus as essential symptoms of the disease in any one of these three stages; he speaks of them as "epiphénomènes" only.

So far as it goes, the history of C. does not tally with this division of the disease into stages; for in it the failure of sight, the pains, and the irregularity of instinctive co-ordinate movement are seen to have made their appearance together. Nor is this history altogether exceptional in this respect; and therefore the only conclusion to be drawn is that there are some cases, perhaps the majority, in which the symptoms admit of being grouped in the three stages indicated by M. Duchenne.

In the majority of cases, undoubtedly, the principal symptoms of ataxy agree with those which are met with in C——'s case. There is the same irregularity of involuntary co-ordinate movement in muscles perfectly healthy in other respects, the same peculiar pains, and the same anæsthesia. Still there are other cases in which the pains or the anæsthesia are either not very conspicuous phenomena or else absent altogether. Thus, I have met with four cases out of seven, not very advanced in degree it is true, in which there were no pains to speak of, and with two cases (out of the same seven) in which there was no anæsthesia. In the majority of cases, perhaps, the eyesight fails at an early period, and in many cases this failure is associated with some paralysis, often transitory, of the motor nerves, one or other, of the eye, or of some branches of the motor nerves of the face; but there are other cases in which none of these phenomena are present. In a word, the affections of the bladder, rectum, and genital apparatus are not the only features which must be looked upon as accidental—as "epiphénomènes"; and the simple truth is that the idea of the disease becomes clearer just in proportion as this fact is clearly realised.

Ataxy, it is said, may be confounded with several diseases, especially with simple loss of muscular sensibility, with disease of the cerebellum, with general paralysis of the insane, with general spinal paralysis and common paraplegia, with saturnine paralysis, with Cruveilhier's disease, with paralysis agitans, and with chorea and some other affections of the kind; but fortu-

nately, as a rule, very little attention will serve to prevent such confusion.

Simple loss of "muscular sense" has been supposed to be the cause of ataxy, and undoubtedly this is a malady frequently associated with ataxy, and most easily confounded with it. In *simple* loss of muscular sense, however, the sight can supply what is lost; and thus when the eye is open and the attention alive, the involuntary co-ordinate movements as well as the voluntary movements of the affected muscles are all executed regularly.

In disease of the cerebellum there appears, at first sight, to be the same disorder in muscular movements as in ataxy, but this similiarity is deceptive. There is now, curiously, in the same ward, and also under my care, a boy in whom there appears to be some congenital defect in the cerebellum—want of due development probably. This boy has had a very peculiar gait; he reels and rolls about in walking, as if he were giddy or drunk: there is nothing peculiar in the way in which he plants his feet: and this way of walking is precisely that which appears to me, more or less, characteristic of disease in the cerebellum. In ataxy, on the other hand, the gait, as has been said, is staggering, precipitate, the legs thrown about vaguely and spasmodically, and the heels brought down with force at each step. There is something very peculiar in the way in which the feet are planted: the gait does not give the idea of giddiness; there appears to be some want of balance between the flexors and and extensors in each leg, the flexors having the advantage; and, in addition, the muscles, when they act, seem to contract with a sort of jerk—spasmodically. In *certain* diseases of the cerebellum, also, other symptoms are likely to be present which will assist in the formation of a correct diagnosis, especially violent pains, augmented by movement, in one or other part of the head, and frequent and obstinate vomiting. Moreover, in these diseases the onset is generally sudden, and the progress uncomplicated with the peculiar pains and anæsthesia of ataxy proper.

In general paralysis of the insane, the hesitation in speech, the tremulousness of the lips and tongue, the general tremulousness, the true paralytic weakness of the muscles as to voluntary movement, and the mental condition of the patient, must readily serve to prevent the unsteadiness of gait and other evidences of disordered co-ordinate movement from being confounded with those which occur in ataxy; and in other respects also the features of the two diseases are sufficiently distinct.

In general spinal paralysis and in common paraplegia there is true paralysis, more or less complete, of the muscles as to voluntary power, and the muscles moreover are much damaged

as to their nutrition and contractility, and generally as to their sensibility too. In the majority of cases, also formication is associated with numbness, and, what has never yet been noticed in ataxy, the sensibility to difference of temperature is much impaired or altogether lost in the paralysed parts. Very generally there is tenderness in some part of the spine, and not unfrequently pain in the same region or in the paralysed parts; and if there be pain, it is, as a rule, more like dull rheumatic aching than like the peculiar excruciating, stabbing, boring, nipping pangs of pain, flitting from one spot to another in a very erratic manner, and occurring in paroxysms of varying duration, which are present in C—'s case, and which are rarely absent in cases of the kind. And in those cases where progression is possible the gait is almost always sufficiently characteristic—*not* staggering, precipitate, the legs thrown about vaguely and spasmodically, and the heel brought down with force at each step, as in C—'s case and in other cases of the kind, but hampered and slow, partly from want of voluntary power over the legs, and partly from the muscles becoming stiff in moving, each leg being brought forward with evident difficulty, even with the help of an upward hitch of the whole side of the body belonging to it, and the part of the foot first brought in contact with the ground being as a rule, not the heel, but the toes.

In saturnine paralysis it is the voluntary power over certain muscles which is impaired and gone, and the muscles are atrophied and deprived of electric contractility when the malady has reached its height. Indeed, it is difficult to understand how this affection can be confounded with ataxy.

In Cruveilhier's disease, as I showed in a former lecture (Lancet, Jan. 16th, 1865), the wasted muscles are changed in great measure into fat, and, as it were, dissected away, and any errors in movement are such as may be accounted for by this atrophy and absence; whereas in ataxy the muscles are plump and to all appearance perfectly healthy, and the errors of movement are those which refer to want of proper involuntary co-ordinating power. Moreover, in Cruveilhier's disease the pains and anæsthesia of ataxy are not met with.

In chorea there is great want of co-ordinating power in muscular movement, but the rest of the history is quite different from that of ataxy—so different and so well known as to make it altogether unnecessary to recall it to your memory. And so likewise in regard to those other affections which come into the same category as chorea.

And lastly, in paralysis agitans a mistake cannot well be made, for the general features of the disease are more akin to those which are present in general paralysis than to those which are characteristic of ataxy.

In some cases Duchenne's disease has been associated with other diseases of the nervous system, as with Cruveilhier's disease, or with general spinal paralysis or common paraplegia, and in these cases the distinctive characters of the disorder may be somewhat masked; but in ordinary cases there can be but little difficulty in arriving at a correct diagnosis.

The pathology of ataxy is yet in its infancy. The most marked change detected after death as yet is degeneration and disappearance, more or less complete, of the posterior columns and of the posterior roots of the nerves of the spinal cord. Mr. Lockhart Clarke has shown me some beautiful microscopic slides, which furnish most conclusive proof of this fact. But I am not prepared to think that these are the only changes to be met with. On the contrary, I fully believe that corresponding changes will eventually be found in those parts of the cerebrum wherever they are, which have specially to do with the co-ordination of muscular movements.

The prognosis is full of gloom. The progress of bad to worse may be slow, very slow, but as yet there is too much reason to believe that the term "progressive" in the sense of going on from bad to worse is not misapplied. Still I know of two cases which justify a much more hopeful opinion.

The treatment in C—'s case consists in good food and rest, in hypophosphite of soda and cod-liver oil, and in the electrifying of the region of the cord with free positive electricity, and we shall see in time whether any good will come out of it. I am not very sanguine; at the same time I have this to encourage me—that this is the kind of treatment which has done and is doing good in the two cases to which I have just referred.—*Lancet, August* 19, 1865, *p.* 193.

13.—CASES OF PAIN OF THE SPINE.

Under the care of Dr. Henry Dick.

[Patients who suffer from the kind of pain referred to in this paper are generally females of a weakly constitution, suffering from some derangement of the uterine system.]

Six cases of this kind came under observation at the hospital during the year 1864–65. The patients were of ages varying from twenty-four to fifty. The first was a young woman, aged twenty-four; the second a Frenchwoman, aged forty-five; the third a Scotch schoolmistress, aged forty-six; the fourth a strong, healthy woman from Bristol, aged fifty; the fifth a London needlewoman, aged twenty-six; the sixth was a man, sickly-looking and suffering from spermatorrhœa, aged twenty-six.

We now proceed to describe the first case, treated at the hospital as an in-patient, the opportunity being afforded of watching it closely.

M. L. G., spinster, aged twenty-four, from Boston, Lincolnshire. She menstruated at fifteen, but irregularly during the first year. In that year she was under medical treatment for fluor albus. Soon afterwards she went to Germany and got better, and remained well until she attained the age of twenty-one years. For the last four years she held a situation as cook, and during the last three she has been suffering with fluor albus, accompanied with great pain along the spine. For this she again sought medical advice, and was bled; she felt worse, and lost both appetite and strength. For eight months before her admission into the hospital (February, 1865) she could neither walk nor stand, and had such acute pain in the spine that she could not bear it to be touched; and so constant had been the pain for the last seven months that she could not obtain any sleep, and had no appetite.

Such were the symptoms which she presented when she entered the hospital, and which to some extent she had suffered from for three years, sometimes the pain being worse in the morning, but latterly more so in the evening. On a superficial examination of the back, no deformity could be distinguished; but as Dr. Dick had been very sceptical for a long period on the subject of "hysterical pain of the spine," he had been for many years in the habit of examining with great care every case of the kind which came under his notice.

In the present instance Dr. Dick found the spinal processes perfectly normal, but the muscles of the left side of the inferior part of the dorsal portion of the spine, where they pass over the transverse processes, were very slightly raised; there was also a similar very slight prominence of the muscles on the right side of the lumbar portion. So extremely slight were these prominences that they might easily have been overlooked, had not three post-mortem examinations presenting similar appearances attracted Dr. Dick's close attention to the subject.

As the patient could not walk or stand, it was necessary to keep her in bed; as her digestion was also very bad, and she seemed anæmic, the tincture of sesquichloride of iron was ordered, and with her food a few drops of lemon-juice; and the nurse was directed to rub her back with cold water and volatile liniment. She improved a little under this treatment; but in addition a spinal instrument was ordered to be made for her, which was considered the only real means of cure. The instrument is constructed as follows. A clavicular and a pelvic belt are connected behind by two strong narrow steel

bars extending down each side of the patient's back. To the upper part of the steel are fixed two bullock-horn-shaped crutches (for the arms), which in front are connected with the clavicular belt. At those parts of the steel bars or uprights which lie adjacent to the slight prominences of the dorsal and lumbar muscles, as mentioned above, are fixed two oblong narrow steel lever plates, the direct and forcible pressure of which can be increased or diminished at pleasure, by means of a peculiar mechanism already described by Dr. Dick elsewhere.

From the time this instrument was applied the patient was able to leave her bed, her appetite began to improve, sleep was restored and her general health became better. After she had worn the instrument for three weeks, it was taken off in order to exemplify the benefit of wearing it; but the patient was, in consequence, unable to leave her bed, or to remain in the standing position when so placed. On reapplication of the instrument she became immediately at her ease. In the beginning of May she left the hospital to return to Lincolnshire, and has since written to state that she is quite restored to health and continues to wear the instrument.

Similar results to the foregoing attended this plan of treatment on the five out-patients, who from the commencement of wearing the instrument felt relieved, and soon became capable of resuming their usual occupations.

The following clinical remarks were made by Dr. Dick :— I ascribe those acute pains in such cases as the foregoing to rotation of the spine, the cause of which I demonstrated before the British Medical Association at Cambridge in 1864. I have shown, that as soon as lateral deviation occurs, rotation necessarily ensues, and therefore it must be obvious that those pains are caused by the rotation. But what is of far greater importance, the treatment based on this conclusion is always successful. Rotation of the spine may be much advanced in degree, and not recognised in the living subject. I will advert to the details of Dr. Gideon Mantell's case in illustration, as related by Dr. Hodgkin and Mr. William Adams, and the correctness of my assertion will be at once apparent. The most important symptom in Dr. Mantell's case was the agonizing pain at the commencement of his complaint. At the post-morten examination much astonishment was felt at finding such extensive rotation of the lumbar vertebræ, attended with comparatively so little mischief to the spinal processes. In 1851 I had occasion to make a post-mortem examination on a young woman, aged twenty-eight, in whom, as in Mantell's case (except that the affection was a little higher up), I found deviation and rotation of the bodies of the vertebræ, with but little mischief

in the spinal processes. This post-mortem inspection was the means of first drawing my attention to the causes and peculiarities of spinal rotation. The following conclusions may now be drawn :—

1stly. In all cases of chronic pain on either side of the spine, attended with even the *slightest* undue prominence of the muscles over the transverse processes, an anatomical lesion of the ligamentous and bony part of the spine exists, combined with deviation of the bodies of the vertebræ and rotation.

2ndly. That the term "hysterical" pain in the spine should have no place in our nosology.

3rdly. For the relief and cure of those spinal pains, mechanical means are requisite, and which can be accomplished by the action of the instrument above described.

4thly. In cases where the general health is disturbed, appropriate means must be adopted.—*Lancet, July* 22, 1865, *p.* 91.

14.—CASE OF EPILEPSY WITH INSANITY, CURED CHIEFLY BY MEANS OF ICE TO THE SPINE.

By Dr. John Chapman, Somerset Street, Portman Square, London.

[The patient was forty-two years of age. He had fits in childhood, but they left him. In 1854, however, when thirty-three years of age he had a severe epileptic convulsion. Two years subsequently he had another fit, which was followed by insanity of three weeks' duration. After this he had constant fits up to the present time. His attacks have gradually increased in frequency : during the last twelve months he has had on an average three fits daily.]

Besides his fits, he has curious visions of animals of abnormal forms, of boys destroyed by machinery, &c. Has dreams of the same kind. He often has a sensation in the eyes as of a glowing electric light, which, changing, assumes various colours ; often, too, he sees men working in the flame. Has much headache, the forehead being "blazing hot" each morning ; generally when he does sleep, sleeps very heavily, and frequently lies awake. His dreams are so horrible and distressing that he is afraid to go to sleep. His memory is very greatly impaired : when going from one room to another to fetch anything, often forgets what he intended to fetch ; and any instruction given him by his wife or others when he goes of an errand he is always obliged to write down. Not infrequently, and without first having a fit, he loses his consciousness for short periods. During such times, he is said to talk more or less incoherently, and often to appropriate small objects

within his reach. His eyes are bloodshot every morning, and have a mist before them; they are also habitually lachrymose. Has suffered from piles; ten days ago passed blood from the bowels, which are often constipated. Passes urine with difficulty; often it merely dribbles away: he has insufficient expulsive force. His hand and feet are always cold and clammy: gloves and socks, however thick, will not enable him to keep them warm.

I ordered ice to be applied along the whole spine during two hours four times in each twenty-four hours, one bag being applied at bedtime, one being used during the night, and the other two during the day.

26th. Has had no fit since the ice was first applied. The headache has ceased; the sleep is greatly improved, and is much more refreshing; the appetite is also much improved, and the patient looks much better. His hands and feet are becoming warm. Pulse 84; tongue clean; bowels "nicely open;" urine still expelled with difficulty. To continue the ice as before, and to take acid. sulph. dilut., ℥xii.; quinine disulph., gr. ss., b.d.

29th. Has not used ice either yesterday or to-day, being unable to buy any, and having already pawned his coat. Had a "bad night" last night, and this morning while walking he had a slight wave of vertigo; but has had no fit since the 16th inst. I saw when he entered my room he did not look so well as he did on the 26th. He looked just as if he had had no sleep last night. I applied ice along the back of his neck and between the shoulders. Immediately he began, he said, to see more clearly, and shortly afterwards asked me if I did not see a change for the better in his face, which, indeed, became plainly visible while I was writing this note. He says his memory is wonderfully improved, and that, excepting last night, he has slept "splendidly." Pulse 80. The discharge of blood from the bowels has not recurred. They are now slightly constipated. To continue the ice and medicine as previously prescribed, and to keep the bowels open by castor oil.

June 2. Since 29th ult. has used ice, and taken the medicine as ordered. Has had no fit. Sleep and appetite continue "first-rate." Does not think he has had any dreams during the last three nights, and has had no hallucinations in the day time. His forehead is now cool, and his eyes are no longer either bloodshot or obscured by "the mist before them" when he rises in the morning. They have not even been watery during the last two days. "My feet," he says, "are very warm now." Pulse steady, 84. Continue the ice as before, and take quinæ disulph. gr. jss., acid sulph. dilut. ℥vii. before dinner daily.

10th. Still no fit; feels quite well; is delighted with the

improvement in his memory; can now expel his urine with natural force, and in full continuous stream; bowels constipated three days; took castor oil on the 8th inst., when they were freely opened. To use two bags of ice during each night as before, but only one in the day time, and to let that one be wrapped in flannel.

12th. On the night of the 10th he tried the experiment of going to bed without the ice-bag, but could not go to sleep, and was very restless, although very weary. He went to bed at 9.30 p.m., and continued awake till after 12, when he resumed the ice-bag, and went to sleep comfortably forthwith. He says he can tell the state his brain is in by the appearance of the candle-flame, which, before using the ice, always seemed to him, as it does now at times, as if surrounded by a large, luminous, coloured haze, the flame itself being like a red mist. If his brain is in an excited state this phenomenon is still observable; but on using the ice it disappears: the candle assumes its true character, and then he becomes capable of refreshing rest and sleep.

18th. While standing talking to me, and seeming quite well, he became silent for a moment, and then began talking incoherently, saying, among other things—"Yes, I can take the flowers for my brother." His face became pale, and his hands quite cold, and, after I had placed him on a sofa, he turned a parcel, which he held in his hand, round and round, looking at it in a vacant unmeaning way. I, at once, applied cold water to the back of his neck, then eau de Cologne—blowing upon it to produce rapid evaporation: he was thus not only kept from becoming worse, but actually recovered a little; meanwhile I procured ice, the application of which speedily and completely restored him. His hands during his restoration became quite warm again. After recovering he was surprised to find some metal crests which did not belong to him in his pocket; these, which he must have appropriated while at a saddler's shop, whither he had been on an errand, he begged me to restore. I sent him home with a bag of ice along his spine, requesting him to continue the treatment last ordered.

July 10. Still no fit since the first day I prescribed for him. Sleeps well, and continues well in all respects. Each bag of ice to be now enclosed in thick flannel.

13th. No fit yet. Having been reading all day (Sunday), and having been without ice all the afternoon by way of experiment, he found, about five o'clock, that the words became unclear. He continued reading, when the words began to blend with each other, and then having got a candle to read by, he found the flames surrounded with a halo which gradually increased. About 8.30 p.m. he went out for a walk with his

wife, when he observed the lamps looked fiery red, and as if surrounded by a haze of the same colour. On returning home and observing the candle he saw as far as the light extended a generally diffused red haze. He felt no pain, but great nervousness and excitability, and, as he says, would "soon have quarrelled with any one." He "then felt it time to stop," and therefore put on an ice-bag. After doing so he lay watching the candle-flame, which gradually assumed its natural appearance—completely so in about 45 minutes. He then fell asleep, slept soundly all night, and feels and looks quite well this morning. He ate half a pound of beef-steak on Saturday: he dared not have done such a thing, he says, before I began to treat him. To use only two bags of ice daily —one at night and one each morning.

August 17. This patient continued to improve in health and strength so decidedly that early in this month I expressed the opinion that he might resume regular work, provided it were light.—*Medical Times and Gazette, Sept.* 2, 1865, *p.* 249.

15.—CROTON OIL IN NEURALGIC AND RHEUMATIC AFFECTIONS.

By Dr. S. C. Sewell, A.M., L.R.C.S.E., Ottawa, Canada.

[Dr. Sewell gives the following account of the use of croton oil in neuralgic and rheumatic attacks.]

I employed croton oil in other neuralgiæ with most gratifying results. Here are two cases of sciatica selected at random to shew the rapidity with which relief is afforded. In January 1853, was sent for to Sandpoint to see Mr. A. M., aged fifty-six. He was suffering under fearful sciatica. The history of the case was that he had had five or six attacks, and had never experienced any relief under a fortnight or three weeks. I gave two minims of croton oil. The bowels were acted on with progressive relief to the pain, after every evacuation, the lancinating stabs diminished in intensity, and in seven hours there was only a slight dull pain between the sacrum and femur, and he was able to walk about. He got three quarters of a grain of muriate of morphia repeated for two or three nights, no farther treatment being required. He was ordered pills of croton oil and ext. coloc. comp., half a drop in each dose to be taken when another attack came on. He was thus enabled to cut short the attacks for years, and has now been free from them for three or four years.

Case No. 2.—October 4th, 1864, at 5 a.m., was called to see Mr. H. M., who had sciatica of the left nerve. Had been ill for three weeks, said: "*that he had tried everything*" and was

suffering worse than ever. He was lying on his right side, and could only turn his head a little to speak to me, and even that motion brought on a paroxysm sometimes. I ordered two drops of croton oil, which operated very copiously: at five that evening he was free from pain, got out of bed for the first time for three weeks, dressed himself, spent the evening with his family, and walked up and down stairs as well as ever he did in his life. After three or four days, the pain returned, but in nothing like the same intensity: the after treatment was in order as follows, turpentine, iron, iodide of potassium—the hot summer change of air; and, by the advice of a physician in New York, enemata of ext. belladonna at bed-time. In these and all other cases of neuralgia and rheumatism, where I have used this remedy, there is always a most extraordinary quantity of black fæces evacuated accompanied by very severe tormina. If the dose be repeated in two or three days, the evacuations will be natural and the tormina trifling. As these black stools always occur even if the patients have already taken Cooper's pills, calomel and jalap, or other drastics before my arrival, I am led to believe that there is some connection between most neuralgiæ and an impacted state of the saccula or valvulæ conniventes of the colon, otherwise it is impossible to explain where all these black fæces come from, and the relief to the neuralgic pain *pari passu* with the progress of the evacuation. That croton oil exerts a specific action over neuralgiæ is probable from the following experiments made on two cases of sciatica. I selected elaterium as being the purgative most analogous in its ostensible operation to croton oil, but the evacuations were attended by no relief to the pain. Half a minim of the latter given after the exhaustion produced by the former was over, gave the desired ease. There are certain forms of neuralgia almost wholly confined to women, although sometimes effeminate men and onanists are afflicted with them. These are neuralgiæ affecting portions of the fifth pair of nerves, and always associated with oligaemia more or less pronounced. The principal seats are half the scalp or hemicrania, the vertex, the exit of the three branches of the fifth nerve upon the face, the frontal and supra-maxillary exits being more commonly the seats of pain. It must be first first ascertained whether a diseased tooth be the cause of pain, or whether there be suspicion of malarial taint, one will require the dentist, the other arsenic, &c. There being no suspicion of either, we have to observe whether the paroxysm be attended by local congestion indicated by slight heat and redness over the affected nerve. If so, then muriate of ammonia gives speedy relief, to be followed by constitutional treatment such as iron, porter, exercise and the shower bath. Should there be no local congestion,

then chloroform, aconitine or atropine, applied externally or entropically, give ease, as does tr. belladonna internally, the constitutional resources being manganese and iron combined, quinine, exercise, sea-bathing, &c. But even in these cases we sometimes derive benefit from croton oil, where there is habitual constipation, or scanty blackish liquid stools, which often are present, when the bowels are loaded with fæces. In these cases, I give one quarter minim croton oil combined with ten grs. of pil. rhei co. The following is an instructive case being one of malarious neuralgia. On the 10th January, 1864, I was called to see Mr. J. H., at 7 a.m. For nine days he had been seized every morning with severe neuralgia of the right frontal nerve. At first it began at seven a.m., but each morning it began earlier, and this day had awakened him at five o'clock. It always went off at one p.m. I ascertained that at the age of three years he had had an attack of fever and ague, and was still residing on the same farm, he now being twenty-eight years old. The place had formerly been much afflicted with intermittent. I gave him a drop of croton oil, which operated in half an hour; the pain immediately ceased: keeping the malarious cause in view, I ordered a scruple of quinine to be taken at bed-time. The pain never returned. I afterwards extended the use of this remedy to chronic rheumatism, which I divide as follows:

1st. Where the minute ramifications of the nerves supplying the muscles, and more particularly the terminal nervous loops, are the seat of disease. In this form the pain is constant and relieved by heat; it is a true neuralgia.

2nd. Where the muscular fibres are the seat of inflammation; when uncomplicated with the former, pain is only felt during motion or on pressure. The sterno-mastoid, the deltoid and the deep lumbar muscles are the most common seats of this form. It is alleviated by heat, and stimulating embrocations.

3rd. Where the periosteum and fibrous insertions of the muscles are at fault. Here the pain is deep-seated, affects principally the long bones, and is aggravated by heat, being worse when warm in bed. When the case has continued any length of time, the periosteum of the affected parts is always found thickened. I believe these cases never occur except where there is a mercurial, a syphilitic or a mercurio-syphilitic taint; these are amenable to iodide of potassium, biniodide of mercury, guiac. sulphur, ginger, medicated baths, &c.

4th. Where two or more of the above forms exist together.

The first second and fourth forms are all benefited by the use of croton oil; the formula I usually employ is the following: ℞. Ol. tiglii ℥ ij. ext. colo. co. ℈ ij. M. ft. massula in pillulas xij. dividenda, sig. sumat i. vel. ij. vel. iij. p. r. n.

The first form being purely neuralgia, needs not to be illustrated by any cases; but it may be doubted by many whether the second form is equally benefited. I shall give a case. On the 20th of July, 1860, 7 a.m. called on Mrs. W., æt. 22, who had been suffering for the three days with "*crick in the neck*," which had continually augumented in intensity. The sterno-mastoid was slightly swollen, painful on pressure, and the slightest movement or even a person walking heavily across the floor, caused intense agony. This was without doubt a case of pure muscular rheumatism, I ordered a hot pediluvium and a liniment of equal parts of Fleming's tr. of aconite and laudanum with a little soap. An hour after, her husband came to me, and said that his wife could not stand the pain, and that something more must be done. I ordered two minims of croton oil, which she got at 9 o'clock. At 2 p.m. the pain was entirely gone. Pleurodynia is a good example of the mixed form, 1 or 2 being predominant. Commonly a hot foot-bath, fifteen grs. of Dover's powder, with or without a mustard plaster will remove the complaint in a few hours. Some cases however are more rebellious; these can be speedily cured in a few hours by the remedy in question.

In acute rheumatism both fibrous and articular, I have fancied that it diminished the pain, and shortened the disease; but many careful observations are needed to establish its value in a disease whose treatment is still a matter of such discussion, that many doubt the utility of any mode of treatment.

It is to be remarked that the use of croton oil does not always or even generally exclude other treatment. If in a case of sciatica it be resolved to follow up the treatment, by oil of turpentine, time must be given to allow the liquor sanguinis to re-accumulate, else one drachm will produce severe strangury —*Canada Medical Journal, Dec.* 1864, *p.* 277.

16.—NEURALGIA AND HYPOPHOSPHITES.

Dr. T. Hayes Jackson, Darlington.

[Last autumn Dr. Jackson was attacked with neuralgia in the back, left thigh, and leg.]

In a few weeks, the pain became more agonising; and I lay in bed for days a gaunt specimen of mortality stuffed with drugs, potent and impotent. Hypophosphite of soda having failed to relieve (in September last) in ten grain doses (as recommended in an able article written by Dr. Radcliffe, in the British Medical Journal, for November 1863), I determined to make a second trial of the hypophosphites of soda in much larger doses. I began with a drachm three times a day in beef-tea. In a few

days, the effect was magical; the pain that I had endured for six long weary months subsided; and now I hope to enjoy better health, and thank God for all his mercies.—*British Med. Journal, March* 4, 1865, *p.* 234.

17.—OBSTINATE CHOREA TREATED WITH THE CALABAR BEAN—ENCOURAGING RESULT—PARALYSIS AGITANS TREATED BY THE SAME.

Under the care of Dr. JOHN W. OGLE, Physician to St. George's Hospital.

[The patient was fourteen years of age, and had suffered from chorea for several months. Steel, antimony, zinc, arsenic, and valerian had been tried, but without any favourable result. On admission it was determined to try the effect of Calabar bean.]

Having obtained a number of the beans, I got Messrs. Bullock and Reynolds to make me a tincture or alcoholic solution. Of this I gave four drops for a dose thrice daily, increasing it gradually during the course of nine weeks until he took eighteen drops three times a day. During the whole of this period no change was observed in the pupils of the eyes, but the boy, without the use of further medicine, recovered almost entirely the power over his muscles, so that he left the Hospital and went home into Hertfordshire about the 6th or 7th of April almost quite well, the want of control in certain movements being only occasionally perceptible. He was requested to return to the Hospital if any relapse occurred, but we have seen nothing of him.

I have now an obstinate and violent case of chorea (in a young woman) in St. George's Hospital which I am treating with Calabar bean.

I have recently being trying the Calabar bean upon an out-patient with very severe so-called *paralysis agitans*, but I have not obtained (as, indeed, I hardly expected I should) any desirable result. Indeed, no result was obtained either as to power of controlling the movements of the muscles or as to the action of the pupils of the eyes. The form of preparation used was the alcoholic solution supplied to the hospital by Bell, of the strength of one drachm of the bean to one ounce of rectified spirits of wine. Of this, twenty drops were given, diluted, thrice a day, and increased, by ten drops at a time, to one drachm in the course of six weeks. For one month he took one-drachm doses thrice a day, and then it was increased to eighty drops. This he took for three weeks, and then he took one-and-a-half-drachm doses for two weeks. At the end of

that time, no effect being produced either on the muscles of the limbs or the eyes, I discontinued the remedy.

I have given the details of this unsuccessful case to show what doses of the Calabar bean might be given with impunity. —*Med. Times and Gazette, Sept.* 2, 1865, *p.* 256.

18.—ON A NEW REMEDIAL AGENT IN THE TREATMENT OF INSANITY AND OTHER DISEASES.

By Dr. S. Newington, B.A. Oxon., Ticehurst.

[The following remedy is a powerful and valuable means of withdrawing the blood from any diseased organ to which there is an abnormal determination.]

While staying at Matlock Bath, I was induced to try the effects of being wrapped up in clothes steeped in mustard-and-water, and applied to the whole legs and to the lower part of the abdomen. After the removal of a wet towel which had been applied round the head and was very uncomfortable, I began to experience the most soothing effects, and gradually passed into a dreamy semi-conscious state, which lasted during the half-hour I was under treatment. On getting up, I felt very lively and joyous, the liveliness lasted the whole day; and for nearly twenty-four hours there remained a pleasant tingling sensation in the legs, which were affected in no other way than by redness. It occurred to me at once that this kind of application might be very serviceable in certain cases of insanity, and immediately on my return home I set about making experiments for the purpose of testing its value. The first experiment was upon myself.

On retiring to rest I ordered a large basin of linseed-meal and mustard (ten parts of the former to one of the latter) to be made into a paste, and spread upon a sheet of brown paper sufficiently large to cover the whole abdomen, a piece of muslin being interposed to keep the skin clean. In a short time I fell asleep, and was conscious of nothing till eight in the morning, when I was partially roused by persons about me; but I was unable to speak or move. One of my medical assistants was thereupon sent for, and he pronounced me in a state of stupor from some narcotic. Though I was unable to speak, I heard the whole of the conversation, and was in a dreamy semi-conscious state. On the administration of some stimulant I presently recovered.

Another form in which I use the mustard is this:—Two handfuls of crude mustard are tied in a cloth and placed in hot water, then squeezed in the hand until the strength of the mustard has been extracted. A thick towel, long enough to

reach round the loins, is then wrung out of this infusion, wrapped round the body, and covered with a large piece of macintosh. In one case a patient suffering from acute mania, who was restless, sleepless, and refused food, was thus treated with the greatest benefit. Before the application the pulse was 108, but after two hours of this treatment it had fallen to 60 in a minute, and the patient was in a quiet semi-conscious state. Afterwards he took his food regularly, and in a short time left perfectly recovered.

A third form in which this derivative treatment may be applied is as a mustard bath : in other words, an ordinary warm bath into which have been thrown five or six handfuls of crude mustard. In some cases the deep hip-bath only may be used ; but in severe cases of mania the whole body of the patient, with the exception of the head, should be placed in the bath. A lady so treated, who had during the last year had four attacks of violent mania, each lasting for five or six weeks, has now for twenty-two weeks had no further attack, although the symptoms usually forerunning the seizure have on several occasions occurred : the mustard bath appears to have warded off the recurrence of the excitement. In this case the bath was used once every twelve hours, for half an hour at a time, during a period of ten weeks ; so that the skin was kept in a constant state of redness. It may be hoped that the habit of diseased action has now been broken, and that this patient, after due probation, may be discharged as recovered.

Mr. W., was brought to me in a strait-waistcoat, and as many as six people had been, it was said, necessary to control him before his arrival at Ticehurst. Notwithstanding repeated doses of opium, he had not slept for six days and nights ; and through the night after his admission he was excited, restless, and talkative. On the following night he was placed in a mustard bath for half an hour, so that he was perfectly red on being taken out. During the next eight days he had six of these baths, and at the end of a fortnight after admission returned home on trial.

A lady who, notwithstanding repeated doses of morphia, had not slept for seven days and nights, was admitted in a state of mania, extremely incoherent and excited. After being in the mustard bath for half an hour she became calm and comparatively rational, and expressed herself as feeling much more comfortable. She was then wrapped up in a blanket and put to bed, where she soon fell into a sleep that lasted for seven hours ; and in the morning she awoke free from excitement. The treatment was continued for six nights, and no

further excitement occurred, although, as she had been insane for two years, her mind remained unsound.

In using the mustard bath, it is necessary to protect the privates with a folded dry towel; and it is of course desirable to have the bath placed near the bed, so that the patient may pass directly from it into his bed. If a little constraint is required on the first occasion of its use, it will rarely be found necessary on any subsequent occasion.—*Lancet, June* 10, 1865, *p.* 621.

19.—ON THE TREATMENT OF INSOMNIA.

By Dr. W. A. Hammond, New York.

[The measures to be adopted in cases of want of sleep may be arranged into two classes.]

1st. Those which, by their tendency to soothe the nervous system or to distract the attention, diminish the action of the heart and blood-vessels, and thus lessen the amount of blood in the brain. 2nd. Those which directly, either mechanically or through a specific effect upon the heart and blood-vessels, produce a similar effect.

Under the first head are embraced many agencies which from time immemorial have been known to cause sleep. Among them are music, monotonous sounds, gentle frictions of the surface of the body, soft undulatory movements, the repetition by the insomnolent of a series of words till the attention is diverted from the exciting emotion which engages it, and many others of similar character which individuals have devised for themselves. In slight cases the measures belonging to this class often prove effectual, but in persistent insomnia they are generally altogether nugatory.

Under the second head we shall find comprehended the means which are chiefly to be relied on in the treatment of cases of morbid wakefulness.

Bromide of potassium can almost always be used with advantage to diminish the amount of blood in the brain, and to allay any excitement of the nervous system that may be present in the sthenic form of insomnia. That the first named of these effects follow its use, I have recently ascertained by experiments upon living animals, the details of which will be given hereafter. Suffice it now to say, that I have administered it to dogs whose brains had been exposed to view by trephining the skull, and that I have invariably found it to lessen the quantity of blood circulating within the cranium, and to produce a shrinking of the brain from this cause. Moreover, we have only to observe its effects upon the human subject to be

convinced that this is one of the most important results of its employment. The flushed face, the throbbing of the carotids and temporals, the suffusion of the eyes, the feeling of fullness in the head, all disappear as if by magic under its use. It may be given in doses of from ten to thirty grains—the latter quantity is seldom required, but may be taken with perfect safety in severe cases.

Alcoholic liquors are highly useful in asthenic insomnia, though in the sthenic variety they are of course altogether inadmissible. A short time since Dr. Van Buren, of this city, mentioned to me an interesting case of asthenic insomnia, in which he had used them with perfect success. They should be given to the extent of producing gentle and continued stimulation for a few hours before bed-time.

The *warm bath* is also a very valuable means of determining blood from the head, and calming nervous irritability. Frequently, especially in children, I have found that simply putting the feet in water of the temperature of 100° F. has been sufficient to induce a sound and healthy sleep, when laudanum and other means have failed.

Cold water applied directly to the scalp is often of great effect in diminishing the amount of blood in the brain. It is not admissible in the asthenic form of wakefulness. When the individual is strong, the heart beating with force and frequency, and the mental excitement great, its influence is almost invariably good. The exact temperature is a matter for the judgment of the physician. I have often used it as cold as ice could make it—32° F. or thereabouts.

In the action of cold water, applied to the head in cases of insomnia, we have another proof of the real nature of this affection. It is known that in Thibet mothers place their wakeful children in such positions as will admit of a small stream of cold water falling from a slight elevation upon the head. I have in some work—on which I cannot now lay my hands—read a very full account of this custom, and seen a cut representing the process. The children very soon fall into a quiet sleep. I have often seen the application of the cold *douche* to the heads of refractory prisoners bring on a deep sleep.

The effects of *position* in aid of other remedies have also been alluded to. I make use of its advantages in all severe cases of insomnia which come under my charge, and we have, in its efficacy, additional confirmation of the correctness of the theory that the condition of the brain in such cases is one of hyperæmia.

The *diet* of individuals affected with morbid wakefulness must be regulated upon those principles of common sense with which

every intelligent physician is acquainted. *Physical exercise* should be moderate and regular.

But all means will fail in those cases dependent upon severe and long continued mental exertion, unless the affected individual consents to use his brain in a rational manner. The disposition of the age seems to be to ignore the fact that the nervous system can exhaust itself by excessive intellectual labour. Even as these last lines are being written, intelligence is received from abroad that one of the most distinguished men of Great Britain has committed suicide, in consequence of insanity produced by over-exertion of his mind. Thus one more victim is added to the long list of those who have disregarded the laws of their being; and again we are reminded that there is a limit to the exercise of our intellectual powers, beyond which we cannot pass with safety.—*New York Medical Journal, June* 1865, *p.* 202.

20.—ON THE HYPODERMIC INJECTION OF MORPHIA.

By H. W. Freeman, Esq., Resident Medical Officer to the Bath United Hospital.

[The following paper, does not give anything markedly original but offers some good observations on the hypodermic method in certain forms of disease, in comparison with the usual effects of morphia when taken by the stomach.]

It is just ten years ago since Dr. Alexander Wood of Edinburgh first introduced the injection of morphia into the cellular tissue of a part affected with neuralgia. Since that period it has been used extensively on the continent and in our own country, not only locally, but generally; the injection of the drug at a remote part of the body has not been found to materially alter its properties.

The endowed cancer ward of the Middlesex Hospital has, perhaps, afforded as large a field for the observation of its effect as most metropolitan institutions of its kind; and in, perhaps, but few hospitals has the hypodermic method of morphia received so fair and impartial a trial in all varieties of cases, both medical and surgical. Long since it has stood alone as the great remedy for pain in those malignant forms of disease, no other class of remedies seeming so efficacious.

The most convenient form of injection is that by a syringe made by Coxeter, which is graduated into six minims. The standard solution used at University College and the Middlesex Hospital is a neutral one, and prepared so that six minims contain a grain of morphia. Sufficient acetic acid is used to dissolve the salt, and afterwards neutralised with liquor

potassæ. The physiological action is the same essentially, although not quite identically, as when the morphia is taken by the stomach. Its effects, however, are more marked and increased in intensity when used hypodermically, one-third of a grain acting as powerfully as one grain taken by the mouth, and much more rapidly. Much as with opium, the action appears to be modified by age, habit, temperament, and idiosyncracy, the tendency always being to rapid alleviation of suffering, to stupor and to sleep. The stimulating stage, although brief, is marked, the patient first experiencing a sensation of slight vertigo and of approaching intoxication—then follow its calmative effects, and something approaching insensibility.

In illustration of the general phenomena, let me draw your attention for a moment to a case now under observation at the United Hospital, under the care of Dr. Falconer.

Louisa M., a middle-aged woman, is suffering from carcinoma of the pylorus, with intense pain, vomiting, and its usual accompanying symptoms. After giving her an injection into the outer side of her arm with a third of a grain, a minute and a half to two minutes elapse before its effects are first felt. She complains of a tipsy feel, slight giddiness, and warmth of body, with other pleasurable sensations. The calmative feeling gradually passes over her in from ten to twelve minutes, proceeding from above downwards, and usually in fifteen minutes she is found sleeping. She remains in a state approaching torpor, and free from pain for a period averaging six to eight hours. Her pupils never markedly contract, and ten or twelve minutes elapse before any effect is produced on the irides. Her temperature rises 1° to 1½° for the first hour after the injection, generally declining as the effects of the drug pass off. This patient has now been under this mode of treatment for upwards of three months ; and, although the disease gradually creeps on, and the effects of the drug are transient, yet it remains clear that pain is relieved, her existence rendered less miserable, and her life has been prolonged.

In this case, as usually happens, forty to fifty minims of the solution of acetate of morphia have been given, and repeated at intervals without relieving pain or producing sleep. Since adopting the subcutaneous mode, her appetite, before much impaired, has much improved; the nausea and vomiting have been considerably relieved ; and, after the narcotic action of the morphia, she rarely, if ever, complains of headache, constipation, nausea, sweating, or dryness of fauces. This is only one of a number of similar cases accompanied by the same phenomena, in which we notice the absence of the usual after-effects of opium and morphia when taken into the stomach, where becoming mixed with the various ingesta, they find their

way slowly into the veins, and are probably in part decomposed in the stomach by its secretion, and are carried out of the system without having entered the circulation; while, if given subcutaneously, the full dose becomes absorbed, and produces its narcotic effects almost at once.

As a remedy in *neuralgia*, much has been written for and against subcutaneous injection. It has been urged that its action is transient, its power non-curative, generating nausea, and sickness, and producing a deplorable state of system worse than the original mischief. A portion of this might hold true in some individual cases; the same exception might be taken to the general class of narcotics; but, in taking the majority of cases, I do not think we can fairly assume that such always occurs practically. Two brief cases, shewing its value in some cases of neuralgia, may prove interesting.

Case 1.—Jane T., aged twenty-four, was admitted into the United Hospital, under the care of Dr. Falconer, with subacute rheumatism of the lower extremities. The blister mode of treatment was adopted. She drew rapidly to convalescence, but got a relapse, with intense neuralgia affecting the intermuscular fibrous septa of the deep muscles of the thigh. A third of a grain of morphia was injected into the affected region. The usual phenomena were displayed, and within an hour she felt free from pain, and remained easy for three days. Symptoms of the same kind of pain were then experienced in the other thigh; a fourth of a grain was injected. She got rapidly well, pain disappeared, and within a week after the first injection she left the hospital. No other drug was administered during the treatment.

Case 2.—Selina W., a hospital nurse, aged twenty, also under the care of Dr. Falconer, was taken with rigors, pain in the limbs, and acute febricula with intense lumbar neuralgia. The prodromata of variola were predicted. The febrile symptoms, however, gradually subsided, but the neuralgia remained persistent. A fourth of a grain of morphia was injected into the outer side of the arm. The calmative effects of the narcotic were well developed for some time, and existed over many hours; she became very drowsy, and inclined to sleep. She recovered without a return of the neuralgic pain.

Both these patients were nervous, hysterical girls, the latter stout and plethoric. Nausea was slightly complained of by one; no headache by either; no dryness of throat, or anorexia; and no subsequent return of the disorder. In these two cases we might observe that the pain was in each purely neuralgic, *unconnected* with any organic disease, or with any known irritation in any distant parts of the body; the effect of the drug

being the same on each, although in one applied to the affected spot, the other at a distance in the arm.

Within the province of ophthalmic surgery, subcutaneous injections of morphia have been found of the most signal use.

Some papers of Professor von Gräfe, which appeared in the Journal of the Association a half year since, went to show the individual merit of atropine and morphine injected about the orbit for wounds of the cornea, ciliary neuroses, iritic or glaucomatous, and for various forms of neuralgia and reflex spasms, due to corneitis occurring traumatically or idiopathically. He said that the use of atropine by injection was very limited; to relieve pain, and to produce its mydriatic effect, it is preferable to drop it on the conjunctiva, unless the eye will not tolerate its presence. In neuralgia of the eye, atropine injected appears quite inert. Morphine I have seen repeatedly prove invaluable. A case in point occurred under my own observation whilst ophthalmic assistant to Mr. Soelberg Wells at the Middlesex Hospital.

Fanny B., a markedly strumous girl of sixteen, was admitted with granular lids, which had produced corneitis and pannus, accompanied with intense photophobia, lacrymation, and ciliary neurosis with excessive spasm of the orbicularis palpebrarum. It was impossible to get a glimpse of the eyeball unless chloroform were used. Atropine and belladonna were subsequently applied to the conjunctivæ for six weeks. No progress took place; spasm and the hyperæsthesia remained intense. It was found, however, on making pressure over each supraorbital nerve as it escaped from its notch, that the lids could be slightly separated; and as the supraorbital nerve gives off some few filaments to the upper lid, and the spasm being thought to be reflex, it was suggested to divide the nerve externally to the notch. Happily the injection of morphia over the brow was adopted; and within forty-eight hours, two injections, each one-sixth of a grain, having been given, the girl could partially open her lids without much distress, the hyperæsthesia daily became less with a nightly injection, and in a week or ten days she could see to read No. 8 of Jäger's test-types.

To further enhance the value of the hypodermic injection of morphia in a surgical point of view, it has been but recently discovered how marked are its effects in prolonging the anæsthesia of chloroform, by injecting from a *third* to *half* a grain of the narcotic before the patient becomes quite sensible to external impressions.

It is just a year ago since the *Versailles Medical Society* first published their interesting researches on this subject of prolongation of anæsthesia. 1. Their conclusions went to show that five to ten *centigrammes* of morphia injected alone without

chloroform produced a kind of intoxication, going on to torpor, but not giving rise to insensibility, properly so-called. 2. Salt of morphia injected during the anæsthesia of chloroform prolonged its duration in proportion to the quantity employed. 3. Although the experiments were performed on dogs, yet it might be used without danger on man, more especially when the duration of an operation gives rise to fears in continuing the anæsthesia by means of chloroform. Three months ago, a second series of experiments, made on dogs, went to support the surgical view, which was quite correct, and to show that injection might be employed without risk.

For upwards of two years past, all capital operations at the Middlesex Hospital have been treated in this way. All the amputations, ovariotomies, herniotomies, for the most part, have received from a third to half a grain of morphia subcutaneously immediately after the operation, and in the majority with good effect; and modern surgery knows how valuable it is in a practical point of view, to calm the nervous agitation of patients after operation, to lessen shock, to procure sleep, and, more especially in ovariotomies and herniotomies, to keep the stomach in a state of physiological rest for some hours afterwards. In these latter two classes of operation, nothing seems to do so well. Nausea might be induced; but whether from shock, chloroform, or morphia, is, perhaps not quite clear; but, judging from the usual phenomena, it would be fair therapeutically to assume that most probably it arose from the effects of the chloroform, seeing that the after-injection of morphia entailed no such symptoms. Allow me to mention two cases, recently under observation, to bear out this fact.

Case 1.—Sarah S., aged forty, was operated on by Mr. De Morgan for ovariotomy; the operation lasted twenty-eight minutes. Half a grain of morphia was subcutaneously given when the chloroform anæsthesia was subsiding. Some spasm occurred during the operation, and continued for an hour or so subsequently. At the end of three hours, a third of a grain was repeated, and again four hours after. After the second dose no tendency to sickness supervened; the patient became placid, and remained in a state of stupor. Some good sleep followed, and she awoke refreshed.

Case 2.—Caroline C., had amputation of thigh performed by Mr. Charles Moore; the operation lasted sixteen to seventeen minutes. Half a grain of morphia was given subcutaneously. She became quiet; dozed for six hours; and had no sickness for twenty-four hours. The morphia was repeated with good effect; and the patient made a good recovery.

To compare the narcotic action of atropine hypodermically, with the like administration of morphia, is but to compare the

therapeutical value of opium and belladonna as narcotics. The effect of atropine might be much more lasting, less transient, than morphia; yet the latter exerts its influence almost instantaneously. The use of belladonna must consequently be more limited in daily practice; and if its use be persisted in for any length of time, the probable atropial phenomenon, its liability to frantic excitement and gay delirium, with its own peculiar effects on the human system, would contra-indicate its continuance.

Atropine, as belladonna, relieves *par excellence* superficial pain. Morphia, as opium, relieves internal deep seated pain. Yet, in this mode of administering morphia, it cannot be looked upon with impunity, knowing how great and powerful are its effects; and consequently great caution and a certain amount of discrimination are demanded in its administration.

Opium, inadmissible in some varied forms of disease, would be doubly inadmissible as morphia given subcutaneously. Opium is inadmissible in advanced stages of phthisis, in old standing cases of chronic bronchitis, or where the air-passages, loaded with profuse secretion, can scarcely be evacuated; and here morphia given subcutaneously, in a moderately large dose, would kill very rapidly; the tendency not being only to diminish to diminish the secretion, but to paralyse the action of the mucous passages in eliminating the secretion. The wheezing dyspnœa of dry asthma would scarcely come within the category.

Habit, it appears, modifies the effects of morphia given subcutaneously; the dose requiring to be gradually increased, yet not so quickly as if taken by the stomach. Many a cancer patient in the wards of the Middlesex Hospital takes from two to three grains daily hypodermically, equalling six to nine grains of crude morphia taken by the stomach. Yet no other remedy seems to answer so well.

It might seem probable, that the frequent introduction of the perforating tube of the syringe into the cellular tissue would cause abscess or erysipelas; but, cautiously applied, it rarely does so. Most of the long standing cases of carcinoma present areas covered with traces of the perforating nozzle, so as not to allow space for its repetition; and although the surface be tender, yet I have never seen either abscess or inflammation supervening. I have never seen or heard of harm being produced by this powerful remedy: yet I have witnessed results which, when it has been cautiously administered, have been as much satisfactory and astounding to the observer, as they have afforded comfort and alleviation of suffering to the observed.—*British Medical Journal, June* 7, 1865, *p.* 639.

21.—ON THE PROGRESS OF THE HYPODERMIC TREATMENT OF DISEASE.

By Charles Hunter, Esq., Surgeon to the Royal Pimlico Dispensary and Lying-in Charity.

My experiments in 1858 were the first to upset the previously maintained theory, that to produce a full medicinal effect upon any given nerve or locality, the medicinal injection should be into that locality itself.

As evidence opposed to that view, two cases of neuralgia were given by me, in which, as much medicinal benefit followed the adoption of my method as had previously followed the use of the method of Wood; and without being accompanied by the disadvantages, which must, under certain circumstances, attend the use of Dr. Wood's plan. So long ago as November, 1843, the injection of morphia had been used by Dr. Alexander Wood, of Edinburgh, and since that date it seems to have been extensively practised by him and his disciples, upon the principle laid down by him in that year. His instrument was made by Fergusson, of Giltspur street. The disease for which he used it was neuralgia; the agent was morphia; and his theory was that of localization to the neuralgic site.

"I would impress upon you," said Dr. Wood in 1858, "that the instrument is not to be put into the place where the patient complains of the pain, but into the spot where you find you can awaken the pain upon pressure."

Employed upon this theory, it seems that in 1858, the use of the instrument had become "nearly universal," for the treatment of neuralgia, in Edinburgh. The evils chiefly dreaded, were gastric disturbance with vomiting, and excessive narcotism. Nepenthe seems to have produced less sickness in the hands of Dr. Wood than opium or morphia, but no one of these agents was found to be infallible.

For fifteen years—namely, from 1843 to 1858, the *local* injection of Wood seems to have been more and more employed in Scotland, but it was little, if at all known or used in this metropolis. It is right to state here, that Mr. Rynd, of Dublin, claims priority in this matter. "The subcutaneous injection," says he, "of medicinal substances, to combat neuralgia, was first used by myself in Meath Hospital in May, 1844." The *Bulletin Therapeutique* for 1861 says that Mr. Rynd employed a solution of ten grains of morphia in a drachm of *creosote* for his neuralgic and sciatic cases, a compound I should be very sorry to inject beneath the skin of any individual.

His instrument was, I believe, a clumsy one for this purpose, as a lancet had to be used, before inserting the point of the syringe. The syringe for injecting nævi and hemorrhoids, which

Dr. Wood employed, was I suspect, inferior in construction to the one I now use, for he states that he thought it best to dissolve his morphia in sherry-wine, rather than in water, lest the latter should rust the instrument.

The syringe which I am in the habit of using for injections will not rust ; it is a modification of one introduced by Messrs. Savigne in 1857 (and described in the *Illustrated Exhibitor* of 1858). The tip of the pipe is finely pointed, and made of *hardened* gold, in which two particulars it differs from the French one invented a year or two before. In October, 1859, I had the barrel of the original syringe enlarged to hold thirty minims, the screw more carefully regulated, and the glass barrel graduated.

In 1858, the plan of Wood was first used in St. George's Hospital, Dr. Pitman having kindly consented to let me try it upon a man (T. G), who had suffered frightfully from neuralgia for four years. At the same time I employed it in a case of severe hemicranial neuralgia with disorganization of the eye, in a young woman (E. P.) about eighteen years old. Both cases received decided benefit, neither were speedily cured ; both had abscess in the neuralgic site, from the continuance of the localization.

I then varied the site of the injection, chiefly puncturing the arm, in both patients. The man went out cured, the young woman went to the Middlesex Hospital. She was the first patient treated by subcutaneous injection in that Institution. Under the care of Mr. De Morgan, the varied site of injection was had recourse to, and the same solution that I had used at St. George's was employed. She received great benefit, and has now been for several years free from neuralgia.

It appeared fair to deduce from these cases :—

Firstly. That in neuralgia equal benefit followed *distant* injection of the cellular tissue, as followed the injection *of the neuralgic site.*

Secondly. That localization was not necessary to benefit a given part.

Thirdly. That for certain reasons it was better not to localize.

The chief being :—1. The infliction of unnecessary pain ; and 2. The almost certain risk of irritating, thickening, or inducing matter in the part from the repetition. It moreover, became evident, that a large class of neuralgia would be excluded from this treatment if it was necessary to inject the neuralgic site.

But as my experiments showed such was not the case, I inferred, that diseases of any one part of the body could be effectually treated by injection of cellular tissue of any other

part. Before introducing this as a *law*, it would be better to furnish one or two *more striking* examples than the two first mentioned, and as regards cure, rather prolonged cases. I will take, for example, such forms of neuralgia as would have been treated in Edinburgh by the local injection.

Case 1.—On the 3rd of June, 1863, Mrs. B., aged sixty-three, consulted me about an attack of sciatica from which she suffered. She had walked lame on account of the pain for two years. Rheumatism and great mental anxiety had preceded it. She had taken two or three grains of morphia daily by the advice of a London physician, up to the time I first saw her. The atropine injection, $\frac{1}{30}$ of a grain, in the arm, produced its characteristic phenomena upon the system; and forthwith removed the pain. She had no pain from that time for about a year, when she came up from the country and again received similar benefit.

In January, 1859, Mrs. R. had severe facial neuralgia, which had lasted some months, and defied ordinary internal as well as local treatment. I injected the arm of the same side of the body, with the acetate of morphia. It caused some gastric irritation, and yet cured the neuralgia. She has had no return of it since that single puncture six years ago.

Case 2.—G. C., aged nineteen, tic-doloureux, left facial region. Duration, three months, quinine and other treatment previously tried without effect for several weeks. Atropine puncture was used on November 16th, 1863, and at intervals of two or three days as the pain happened to recur; each puncture removed the pain before he reached home. He was cured in a fortnight. No return when seen five months after. The injections were made in the arm of the opposite side of the body.

I will now pass on to the second part of the subject—viz., the injection of medicines *into the cellular tissue*, in order to ascertain their *general effects* upon the system. This first took place in November 1858. *Case.*—Edmund Harrison, under Dr. Page, at St. George's Hospital, suffering from delirium tremens, was the first case thus treated. He had been very violent, and without sleep for two nights and three days. Half-grain doses of morphia, by the mouth, had been repeatedly given with no effect. I injected, at the request of Dr. Page, one-half grain into the neck; the patient was soon quiet, and slept altogether about twelve hours. He rapidly got well with the aid of two subsequent injections.

From the good effects of the morphia in this case and a few others, I deduced "that by the introduction of narcotics into the cellular membrane of the body, we have a mode of attacking

and subduing cerebral excitability, more rapid, more certain, and more pure in its action than by the stomachic doses."

Such was my proposition in 1858 relative to cerebral diseases. It was silently received but practically taken up by many leading men, especially in the hospitals of large towns.

My subsequent experience not only corroborates that conclusion, but now leads me to add the following :—That in cerebral affections, medicines called anodynes frequently act so far more effectually, and so differently from the stomachic doses of the same, as almost to warrant us in considering them as diffrent medicines.

Let morphia be taken as a type, it is the agent used more than any other, and has, therefore, been no doubt used both ways by many now present. Taken by the stomach in any ordinary case, let us see how it often acts.

It makes the patient feel sick and qualmish, it nauseates, it even produces vomiting, it causes sleep, but the sleep is disturbed and excited ; the patient dreams more than usual, he awakes in the morning with a dry mouth, with a coated tongue, he feels sick on waking, and does not enjoy his breakfast, neither do the liver or the bowels act as usual, he feels a tightness, or a weight, or a giddiness in the head, throughout the day. In fact, the agent given by the mouth, to *reach* and to *quiet the brain*, has acted as an irritant to the pneumogastric and sympathetic nervous system in contact with which it was first brought.

Let us now see how the patient fares with the same dose given by the cellular tissue. The morphia goes by a shorter road and reaches the gaol at once. The pulse instantly rises, the system glows, the face may slightly flush as the skin gets warm, and rapidly perspires. The pulse then goes down ten to twenty pulsations below the normal. The brain is soothed, sleep is gentle and happy. The patient awakes restored. There is no dryness of the mouth, no nausea, no sickness nor constipation of the bewels, for the morphia has gone to the brain by the shorter and more direct road. The skin is more acted on by this mode, not as a result following the nausea of the *stomachic* dose, but almost as a *direct* effect synchronous with the *first* quiescence of the brain.

I will now proceed to indicate a few of the special advantages that attend the injection of medicines into the cellular tissue, when used for the treatment of diseases *distant* from the site of injection.

1. For derangements of the *cerebral nervous system*, we have, in the hypodermic method, a means of treatment, far superseding in its immediate efficacy any other mode of medication.

In *cerebral* cases, which I have placed at the *head* of the list,

we have hardly to consider pain at all. We have to deal with a sensitive and perceptive organ, not with a nerve. An organ which, for the due performance of its functions, ought really to be at rest one-third of our lives, a third of each day. Pain in these cases is only an occasional symptom—it is one among others of cerebral nervous exhaustion.

The more frequent symptoms of cerebral over-taxation are insomnia, irritability, excitement, melancholy, delirium, mania, loss of reason, &c.

These I submit to be all phases or degrees of cerebral excitement and exhaustion—the one merging into the other; the mildest often becoming the most severe, simply because it was not checked in time. *Insomnia* is a cerebral condition that may come on during any bodily illness, whether accompanied by pain or not. The *anxiety* attending the illness may often be the only cause of the wakefulness in a nervous and irritable person. It may occur without any bodily disease, as in the hysterical, &c.

Prolonged wakefulness for many nights or weeks together may lead to excitement and delirium in one temperament, to melancholia in another, later perhaps in life, Opium and morphia will usually cure these derangements—it will *give* sleep and prevent simply insomnia going from bad to worse. In many cases the opium does its duty well, when given by the mouth; in others, it distresses the patient in various ways. Where the natural tendency is to relaxation of the bowel it seems to suit better than at other times. When constipation is natural it makes matters, in that respect, worse.

Given by the cellular tissue neither morphia nor opium ever constipate. I have used the morphia injection for weeks together, in cases of chronic disease, the bowels acting daily—but never acting without medicine in the same patients, if the morphia was given by the mouth.

Neither is the stomach deranged, nor the appetite interfered with, as with the stomachic dose. In many cases I have found the appetite *improved* by the injected dose.

2. *In melancholia;* the effects of morphia thus administered, are decidedly beneficial. Opium in some form seems to replace the missing elements in the desponding and sleepless brain, and it does so without producing anorexia, &c. The morphia-puncture will in a few minutes restore the lost equilibrium—it will make the patient feel cheerful and happy; he will then eat and take exercise, or go through those professional duties he had entirely despaired of performing, perhaps only an hour before.

3. But it is in *delirium tremens* and in *mania*, more than in any other disease of this class, that the immediate benefit is

most manifest. Although differing in their causes I class these diseases together, for whether *mania* arises from violent excitements, from drink, or from exhaustion, as in the puerperal woman, still it resembles *delirium* from drink in this important symptom—the *insomnia.*

Most cases of this description have had large and oft repeated doses before they are admitted into hospitals; but they have failed to give sleep—the insomnia is almost the essence of the disease—a good sleep obtained, the case is half cured.

It is in this class of cases that a single dose, administered beneath the skin, will at once break the neck of the disease. It will often at once stop the delirium, correct the mental aberration, and remove the exhaustion as produced by the injection. It is the food of the brain, the sustainer of nerve-*force.*

Much is gained by this plan in *delirium tremens.* The patient will not swallow. The subcutaneous injection obviates that difficulty—the stomach will not absorb or digest the opium. The morphia put beneath the skin is absorbed in five minutes. Time is lost by the stomachic dose; it is gained by the hypodermic; uncertainty attends the one plan, certainty the other. Dr. Robert Ferguson told me he counted twenty-four one-grain opium pills in the stomach of a patient who had died in some hospital—unabsorbed, those pills can have done no good, but rather harm, embarrasing the prescriber.

Another advantage is that *restraint is avoided.* During the hours and days that we might wait for the unabsorbed opium to act—the violence, or rather the incessant continuance of the muscular movements, has often seemed to indicate the necessity for the strait-waistcoat. This helps to cause, or increase venous congestion. In fatal cases Dr. Barclay thinks the opium has often borne the blame when the forcible restraint was really more at fault.

By the hypodermic plan the *necessity for restraint* is done away with; the patient, if not asleep in twenty minutes, is almost always perfectly quiet, neither talking nor moving: and thus we see another advantage that we gain, *the avoidance of exhaustion.*

To resume, briefly, concerning cerebral affections. This treatment has advantages especially its own, restoring the proper function of the brain, composing, and giving it sleep and tone, when the same medicine otherwise given has only caused irritation, and delayed the cure, which by the injection would have been more quick, permanent, and effective.

Passing to the *spinal affections,* we find the same advantages to attend the use of the treatment, whilst the medicine employed, and the nature of the disease, may vary much. Here *pain* in

some form or other, *excessive muscular* action, or its *complete deficiency*, are the three chief evils to be contended with.

Insomnia in these cases is an induced or secondary evil.

Morphia is far from being the panacea, even when thus injected, in this class of cases, although so valuable in cerebral affections.

Acute sciatica, for example, may prevent sleep for many nights together; the morphia injection may meet the insomnia, but it does not always cure the sciatica; it palliates the *induced* symptoms, but it not always the agent to strike at the root of *this* disease.

M. Ozanan, very rightly, I think, holds the view that the various alkaloids in opium have each a part of the nervous system on which they more particularly act—morphia, on the cerebral hemispheres; thebaine, on the upper dorsal; narceine, on the lumbar region, &c.

And so with other alkaloids: atropia and strychnine, I believe, strike more surely at the root of the sciatica in many cases, than does morphia or any opium alkaloid. They produce a more tonic change in the affected nerve; and they *do so best* when injected beneath the skin.

I have often wondered whether belladonna and its alkaloids fairly reach the affected nerve when given by the mouth. So long may they be given stomachically with little or no benefit. Do they undergo chemical transformation? is a question one may fairly ask. The woorali is nearly inert when taken by the mouth; I have given from three to six grains to a patient in the course of a week without any marked effect, by that plan; but I have paralysed the legs of a rabbit for many days with only the ninth of a grain when injected.

In *painful spasmodic affections* how important it is to be able at once to arrest both the *spasm*, and the *pain*.

In severe *colic* in a painter, who for hours had been doubled up in agony, a single morphia puncture relieved the spasm, and, of course, the pain, and the bowels, which had for some time been confined, acted of their own accord; the castor-oil that I ordered having been forgotten by the patient.

Dr. Ward, of Winkfield, has found the morphia puncture successful in this disease.

In *retention of urine*, when due to *spasm*, this treatment may be often useful, and relieve the patient in a very few minutes. I was led to use it in one case, having no catheter at hand; micturition took place in the course of ten minutes. When no hot bath is at hand, the catheter absent or contra-indicated, I venture to suggest the morphia puncture as a ready method of relief.

On the 5th of November, 1858, I believe the first case of

tetanus was treated hypodermically; the patient had been admitted into St. George's Hospital with a gunshot wound. The injection in this case was morphia, which gave the patient sleep, but the spasms continued unaffected. Since that time, many cases of lockjaw have been treated hypodermically, and a few cured. The agents that have been injected in this disease, have chiefly been the woorali, atropia, nicotine, morphia, and aconitina; the operators, MM. Vella, Briquet, Courty, Claude Bernard, Follin, Spencer Wells, Dr. Benoit de Giromagny, Fournier de Souisson, &c., &c.

In epilepsy, the effects of atropia injected seem superior to the stomachic effects, being more permanent in curing the fits, and in lengthening the duration of time between the fits in chronic cases. There seems, as in chorea, a kind of tolerance of this agent in many cases. In paralysis, the strychnia seems in many cases more beneficial than when given by the mouth.

Limited space prevents me from entering further upon this class of cases, interesting as the results are, of atropia in epileptic seizures, and of strychnia in painful and paralytic cases; these may form a subject for future consideration.

I pass now to another important object with which the hypodermic treatment may be used—namely, *to diminish vascular action and inflammation.*

When morphia and atropia are given by the mouth very little effect is perceptible upon the pulse. If they make the patient sick, the effect of depression, &c., is secondary; but injected beneath the skin, a primary, direct, and very different effect is produced upon the heart and arteries by these two agents: the one as quickly lowers as the other excites the pulse. Dr. Harrington Tuke felt the pulse of a patient with puerperal mania that I injected in Queen Charlotte's Hospital go down from 140 to 80 in four minutes. Mr. Holmes at my request the other day felt the pulse of a patient twenty minutes after an atropine puncture; the pulse had risen, as it usually does to 120. The deduction is, I think, plain that morphia thus administered may be used as a decided antiphlogistic, but atropine not so. T. B., in St. George's Hospital in April, 1859, suffered excessive pain in the head, with chemosis and severe inflammation of both eyes. Leeches, blisters, calomel, and opium, and morphia by the mouth every three hours, failed to diminish the pain or arrest the inflammation. The morphia puncture acted like a charm; it completely removed the pain, and the inflammation then rapidly subsided. Dr. Ogier Ward in 1860, just one year after the above case was described by me as an instance of inflammation, wrote as follows:—

"Another conclusion may, I think, be drawn from these cases—viz., that pain of any kind, neuralgic or inflammatory,

may be relieved by subcutaneous injection; and as we can only explain the more rapid action of opiates administered in this manner by their immediate absorption into the circulation, it follows as a necessary corollary that in violent pain from acute inflammation, we need not wait to subdue it by antiphlogistic remedies, but proceed at once to the use of anodynes."

Thus, independently, and from his own experience, Dr. Ward has confirmed my views on the subject.

In *peritonitis* I have found the morphia puncture of great value. It helps at once to check the three prominent symptoms—the excessive pain and tenderness, the rapid pulse, and the short quick breathing; it then gives or *allows* sleep.

In *ileus*, in a severe case in which there was every symptom of perforation of the bowel, Dr. Godwin tells me he found half a grain of morphia injected beneath the skin to relieve all the urgent symptoms in about ten minutes.

In ophthalmic practice, Dr. A. Von Graefe has found the hypodermic injection of especial value; and has written a paper to show the various objects with which it may be used in ophthalmic surgery.

In *ague* and *fever*, the hypodermic injection has been extensively used, especially in the Smyrna Hospital by Drs. Chasseau and McCraith; also by Dr. Moore, of Bombay; also more recently by Dr. Desvigne in France. All these physicians agree in the superior efficacy of quinine when injected into the cellular tissue over the stomachic doses. The same rule holds good with quinine as I had shown was the case with morphia—viz., that a lesser quantity was equal to a greater, given by the mouth. "Four or five grains," says Dr. Moore, "are equal to five or six times that amount by the mouth."

I must protest once more against the way all these gentlemen introduce the quinine—namely, with a syringe after incising the skin with the *lancet!* According to Dr. Desvigne, abscess and sloughing of the cellular tissue are results not extremely uncommon, but such as, I think, should never occur.

For the various forms of *uterine pain*, especially for dysmenorrhœa, the hypodermic treatment has been used by Dr. H. Bennett, of Mentone. In all cases, he says, he obtained the benefit in from fifteen to thirty minutes without any of the drawbacks which follow the stomachic administration.

I cannot conclude without remarking, though very briefly, on the use of this treatment for *incurable* disease. In my own hands it has been a boon to many patients for months, perhaps, together, some with incurable neuralgia, others with cancer, or the agony of diseased joints. Life is made bearable by this plan to these poor sufferers. The economy of the amount of

the anodyne required holds good in the majority of these cases. Dr. Giles tells me that he has now a case of cancer under his care in which one-third of a grain injected on alternate days gives all the relief that two grains daily had previously given by the mouth. Such has often been my own experience in this disease. In the cancer wards at the Middlesex, Mr. Watts and others tell me that morphia puncture has for a long time been the main treatment employed, some patients being injected once, others twice, daily. As an *antidote*, and as a diagnostic test, I have long since ventured to propose this plan as the most reliable in cases in which the agent to be employed is fairly soluble.—*Medical Mirror, July and August* 1865, *pp.* 392, 439.

22.—DANGER OF SUBCUTANEOUS INJECTIONS.

Professor Nassbaum, of Munich, has just published an interesting account of an accident which happened to himself. Suffering from neuralgia, he had injected morphia under his own skin more than 2000 times—sometimes to the extent of five grains of morphia in twenty-four hours. Two months ago, he injected two grains of acetate of morphia dissolved in fifteen minims of water, and accidently sent it direct into a subcutaneous vein instead of into the cellular tissue. He gives a graphic account of his dangerous position for two hours, after which the effect passed off. He has seen similar effects in a smaller degree in two of his patients, and the practical lessons are, that as it may be impossible to avoid veins at all times, and one may be punctured unawares, subcutaneous injection should always be done *very slowly*. The effects are so instantaneous that the syringe can be stopped at the first sign of danger, and some of the injected fluid mixed with blood may even be sucked out again by the syringe. It is very remarkable how the effects of the same dose of the same substance differ when directly injected into a vein and mixed with the venous blood, and when they filter into the blood from the cellular tissue through the unbroken coats of the vessels.—*Med. Times and Gazette, Sept.* 23, 1865, *p.* 337.

DISEASES OF THE ORGANS OF CIRCULATION.

23.—CASES ILLUSTRATING THE ACTION OF DIGITALIS ON ENFEEBLED HEARTS.

(Under the care of the Physicians to Guy's Hospital.)

[In some clinical remarks Dr. Gull referred to a case which had been in the hospital some years ago.]

It was that of a man who was supposed to be suffering from a dilated left heart. The rythm of the heart was exceedingly irregular, the patient was very much distressed with shortness of breath, dropsy, and other symptoms. Digitalis was prescribed for him, and it appeared to do him a great deal of good. The heart's action became by degrees more and more regular, his breathing very much easier, and in every respect he was thought to be doing well, when suddenly he died.

Dr. Gull further remarked that he could call to mind about half-a-dozen cases of dilated irregularly acting hearts in which death had occurred suddenly, and it so happened that in every case the patient had been, or was at the time, taking digitalis. Yet, on the other hand, he had many times prescribed digitalis to patients with very irregular, feeble and dilated left hearts, without valvular disease, and with such marked relief and benefit to the patient that the remedy had gained for him the greatest credit. Nevertheless, when digitalis is given in such cases, he considered that the patient ought to be watched day by day, and that this medicine should be discontinued as soon as the heart begins to be more regular and the impulse stronger. This observation Dr. Gull made particularly with reference to the case of dilated, feeble, and irregularly acting hearts. He, however, still further observed,—"I look upon it as a fact, which clinical experience has clearly and definitely settled in my own mind, that digitalis is capable of diminishing the frequency of the heart's beat and of increasing the power of the heart's impulse; indeed, in cases of disease of the left side in which the acting of that organ is very rapid and feeble, if I prescribe digitalis I confidently expect that it will diminish the rapidity and increase the strength of the heart's action."

The next case was that of a patient with dilated irregular heart, no bruit, but physical signs of bronchitis, under the care of Dr. WILKS.

Mary J., aged fifty-four, admitted April 14 into the Clinical Ward. She was a tall, well-built woman, who stated that she had usually enjoyed good health until a few months ago, when she began to suffer with shortness of breath and with a bad cough.

When admitted she complained very much of her difficulty in breathing and of her inability to lie down in bed. The apex of the heart was lowered, and the area of cardiac dulness was considerably increased. The rythm of the heart was irregular, but no bruit was heard. The first sound, however, at the apex was very feeble—in fact, inaudible. Large crepitation was heard all over both sides of the chest. She was ordered tincture of digitalis, ten minims; decoction of senegæ, an ounce every six hours.

April 19. She expressed herself as feeling easier. The heart's action had improved. Her cough was very troublesome. ℞. Mist. cascarillæ co., ʒj.; sp. ether sulph., ℥xx., ter die.

After this she day by day gradually improved; her heart became more regular and her breathing much easier up to the 26th, when Dr. Wilks found her up and very much better, and she had been able within the last day or two to move about the ward, when on the 27th she was sitting on the bed, dressed, and apparently going on well. The Sister of the ward happened to say to her that if she wanted to amuse herself she might help them to dust the ward. The patient made an attempt to get off the bed, but fell back and died instantly.

The Autopsy showed the left heart dilated and somewhat hypertrophied, but, as Dr. Wilks remarked, much more dilated than hypertrophied. The lungs were emphysematous, and the lining membrane of the bronchial tubes very vascular and contained some viscid mucous and purulent matter in the tubes. The kidneys were large and granular.

The next case was also an example of dilated left heart without valvular disease, under the care of Dr. Wilks.

John W., aged forty-six, a farm labourer, was admitted into the Clinical Ward, June 7, 1865. He said that he had had rheumatic fever five years ago, but had been perfectly well up to a month since. He then got wet through, and difficulty of breathing and aching pains in the limbs followed. Shortly afterwards his legs began to swell, and he was then compelled to give up his work. He had been troubled lately with vomiting and purging.

He was a tall, hardy-looking man, with large bones and well-developed muscles. His features were large and regular; alæ nasi thin; upper lip long and rather thick; teeth sound and regular, excepting the molars, which had decayed. He stated that he had always been temperate.

His present symptoms were great dyspnœa with hurried, heaving respiration, 30 per minute. His countenance was distressed and turgid. His expression was such that there could be no doubt but that he was very ill indeed. His heart's action was very peculiar. It was rapid, irregular, and at times appeared to intermit. Indeed, the heart seemed to tumble about without any real rhythmical action. His pulse was extremely weak and could scarcely be felt, and it was impossible to count it. There was increased dulness over the region of the liver, extending nearly down to the crest of the ilium. His hands and feet were cold. Bowels had been open several times. Urine became slightly opalescent on boiling and after the addition of nitric acid. His feet and legs were swollen and œdematous up to the knees. ℞. Infusi digitalis, ʒj., 6tis hôris.

8th. He had a sudden paroxysm of dyspnœa and great pain over the præcordial region late last night. His limbs became cold and his breath felt cold. He had taken one dose of his medicine, but that was now ordered to be discontinued, and brandy was administered. Hot poultices were applied over the præcordia, and he slowly rallied again.

9th. Dr. Wilks saw him early this morning. He appeared exceedingly ill. Pulse very feeble, and could not be counted. His breathing so short that no careful examination could be made. R. Tincture of digitalis, ℥ss. 2 tis. hôris.

After taking two doses of this mixture he appeared to improve, and expressed himself as feeling easier.

On the 10th he died.

Autopsy.—The head was not examined. The lungs were in that condition familiarly known as "heart lungs." The heart was very much enlarged, especially on the left side. The left ventricle was not contracted, and contained a small clot and some fluid blood. This ventricle was very much dilated, and its walls did not seem to be hypertrophied, neither were they attenuated. The endocardium was thickened, but there was no valvular disease. The muscular tissue of the ventricle was pale looking, and easily broken down under the pressure of the finger. Dr. Wilks called attention to the increase in the connective tissue, extending into the muscular substance of the left ventricle, which appeared as bands or layers, extending from the thickened endocardium amidst the muscular structure. The coronary arteries were not rigid, nor otherwise diseased to the naked eye. The liver was large, and had the usual nutmeg appearance in heart disease. Spleen very firm; otherwise normal. Kidneys large and apparently highly congested; on section, looked coarse, but not exactly granular.

A microscopical examination showed the muscular tissue of the hearts of the last two patients to have undergone fatty degeneration. In the case of this man this degeneration was exceedingly well marked. The transverse striæ of nearly all the muscular fibre had been replaced by bright, sparkling granules. On section, showed the connective tissue between the bundles of the muscular fibres unusually distinctly, and it had been evidently increased in quantity. In this case the fatty metamorphosis would appear to have been due rather to the pressure of the increased quantity of the connective tissue on the minute capillaries than to disease in the coronary branches themselves.

Dr. Wilks, before ordering digitalis for this patient, remarked that, judging from his experience, this was just one of those cases in which digitalis might be expected to do good; but whether it would save this patient was somewhat question-

able, considering "how very ill he was." Dr. Wilks stated at the same time that he had lately seen a case of a woman who was apparently suffering like this man, with dilated, enfeebled left heart. There was great dyspnœa, and excessive but very irregular action of the heart. No perceptible impulse. The first sound could not be distinguished. The pulse was exceedingly feeble and quick. The patient was in the greatest distress. He recommended that half-drachm doses of the tincture of digitalis should be given every four hours. After the patient had taken a few doses she began to gradually improve, and continued to do so, and became able, although but for a time, to get about again.

Another case, under the care of Dr. Wilks, that we had the good fortune to see, was that of a man who had been admitted into one of the Surgical wards for an injury, but as his breathing was so very short, and he was expectorating a quantity of bloody mucus, and as he had other symptoms indicating chest disease, Dr. Wilks was asked to see him. Dr. Wilks found that the patient was suffering from dilated and enfeebled heart; but there was no bruit to indicate valvular deficiency. The rhythm of the heart was exceedingly irregular. There was dulness and crepitation at the base of the right lung, supposed to be due to pulmonary apoplexy. The liver was enlarged, and could be distinctly felt below the level of the umbilicus, and his face and conjunctiva had a yellow tinge. His feet were œdematous, and his urine scanty and high coloured, but it did not contain albumen. The patient was ordered half-drachm doses of tincture of digitalis every four hours.

We had an opportunity of watching the patient day by day. After the second day he began gradually to improve, his heart became more regular, the first sound could be distinguished, and the dyspnœa subsided, and after a week he was very considerably better, and he quite got over the attack. The dose of the digitalis was diminished as the patient improved.

Having now briefly mentioned these interesting cases, we will next proceed to inquire how far the sudden deaths of these patients were really due to the action of the digitalis, and how far to something connected with the disease itself. And before it is possible to come to any conclusion on this point, it is absolutely necessary that we should endeavour to determine whether experience and pathology tend to teach that patients with enfeebled dilated left hearts without valvular, are liable to die suddenly.

Clinical experience in such cases tends to show that the rule is for such patients not to die suddenly, but rather to suffer with dropsy, hepatic enlargement, albuminuria, and with other complications, and that death is most frequently due to uræmia,

to pneumonia, acute bronchitis, apoplexy, or some other accidental cause. Nevertheless, although such is the rule, we think that not a few cases might be collected which would tend to show that those suffering with this disease are liable to die suddenly. We have notes of one case in particular, which came under our notice.

A gentleman, aged sixty, was found suffering with well-marked symptoms of dilated left heart without valvular disease. His heart's action was exceedingly irregular, and there was no visible or perceptible impulse and no bruit, and the area of cardiac dulness was markedly increased. Mucous râles were heard all over the chest. There was no albumen in the urine, no marked hepatic enlargement, and but slight œdema. He was ordered to remain in bed, and five grains of ammonio-citrate of iron were prescribed to be taken three times a-day.

He remained much the same for some days, but after a week the heart's action began to improve ; day by day it became more regular, and at length—fourteen days after he had been first seen—finding that his pulse was almost quite regular, that the rhythm of the heart was equally so, and as he appeared otherwise much better, he was allowed to get up and dress himself. The day after this he did not appear any worse. He was cheerful, and expressed himself as feeling better. He got up, and remained up all day, and seemed to be doing well. About 8 o'clock, however, he said he wished to get into bed ; he made an effort to do so, when he fell forwards and died.

We thus see that with dilated heart death may occur suddenly, whether digitalis be given or not. We will next inquire if there is anything in the morbid anatomy or known pathology of the disease which leads us to think that such patients may die suddenly.

In by far the majority of cases of cardiac disease in which death has occurred suddenly, and that really due to the heart itself, there is evidence of degeneration in the muscle of the heart. Of course we make an exception when death is due to sudden blocking of the mitral orifice or to any analogous event.

Experience has shown that persons whose hearts have undergone fatty degeneration are liable to death from syncope ; and, moreover, it has further shown that the greater the dilatation of the cavities, and especially of the left ventricle of the heart, and the less the hypertrophy, the greater the danger to the patient. Dr. Walshe, in speaking of the liability of patients with aortic regurgitant disease to sudden and instantaneous death, says that hypertrophy of the left ventricle mysteriously lessens the likelihood of sudden death.

In comparing this kind of dilated left ventricle with that which is occasionally seen as the result of acute rheumatism

in young persons, we perhaps ought not to consider that the liability to sudden death is equal in both. For in the latter it is comparatively, although perhaps not strictly, a local disease, and tissue in other parts of the body is tolerably healthy; whereas, in the case of pure dilated heart in the person of middle or rather advanced age, there is degeneration in the blood vessels throughout the body, and in consequence disturbed function and atrophy in most of the organs of the body. The consequence is that while in the one patient any functional disturbance in one organ is likely to be compensated by increased functional activity in another organ; yet in the other patient the organs themselves have so much degenerated and lost their power that they are not equal to the emergency and to the sudden calls upon them; hence liability to sudden death, if exposed to certain accidental circumstances, will be much greater in one than in the other. Therefore, there seems good reason for thinking that a patient with dilated left heart, and especially if of middle or of advanced age, when, as is usually the case, there are so frequently concomitant degenerative changes in other organs, has a tendency to die suddenly.

We would here call attention to the fact that the female patient under the care of Dr. Wilks took ten drops of tincture of digitalis every six hours for five days. On the 19th it was discontinued, and on the 27th she died, so that there was a seven days' interval between the last day of taking the digitalis and the day of death.

Now when we call to mind how small the dose and the seven days' interval, it appears to us that it would be very difficult to say that the digitalis had anything to do with her sudden death, but rather to conclude that it was like the case that we have before mentioned, due to some unknown momentary impulse, which brought about death from syncope.

There is another interesting fact connected with one of these cases that it is necessary to bear in mind, and that is, one that Dr. Hilton Fagge called attention to at the time when the heart of the male patient under Dr. Wilks' care was being opened, that the muscles of the left ventricle were not contracted, but flaccid.

Now, bearing all these things in mind, it appears to us, that there certainly is no proof that the sudden death was in any way due to the digitalis; and when we consider that there are facts which tend to show that patients with this form of cardiac disease are liable to die suddenly; and moreover, as Dr. Gull has observed, this remedy is given with considerable relief and benefit to many patients with dilated, feeble hearts; it is probably right to conclude, with Dr. Gull, that, in such cases digitalis may be given, and probably the patient will derive

great benefit from it; but it must be cautiously given and carefully watched; and further, that in cases where death is threatened, as in the the case referred to by Dr. Wilks, by the extreme feebleness of the heart itself, and where there are symptoms of cardiac "asthma," digitalis appears to be a very valuable remedy. And although the cases we have brought forward may seem at first glance to be unfavourable to the view that digitalis acts as a tonic to a feeble heart, yet we venture to say that a careful consideration of the whole subject, from more cases, and taking into view the whole of the circumstances, will show that digitalis can be given, not only with safety but with advantage in such cases. Such patients are liable to die suddenly, and will do so now and then whether digitalis be given or not. That this remedy does good, for a time, at least, there can, we submit, be no doubt.—*Medical Times and Gazette, July* 29, 1865, *p.* 114.

24.—ON THE ACTION OF DIGITALIS IN DISEASE OF THE HEART.

By Dr. William Murray.

Dr. Murray having carefully observed from twenty to thirty cases of cardiac disease treated by digitalis, arrives, in reference to the action of this drug, at certain conclusions which are in accordance with the theory lately advanced by Dr. Anstie as to stimulants and narcotics, namely, that all true stimulants tend to bring tissue action to its normal standard; that when such action is in excess, a true stimulant will reduce it, and when below par will raise it to its proper level. Dr. Murray believes that the action of digitalis, when properly investigated, will confirm these views; and he proceeds to show, "1st, that digitalis will stimulate and strengthen a weak heart, and that the weaker the muscular tissue of the heart, the safer will be the administration of the medicine; 2nd, that in a hypertrophied heart it will fail to reduce the pulse either in frequency or strength, and in such cases will prove dangerous; and 3rd, that in a weak organ, acting, because of its weakness, with great rapidity, it will reduce the number of its contractions, and, as it were, strengthen or tone them down. To strengthen and quicken the action of a weak, slowly acting heart, and to reduce the number of the rapid strokes of a feeble heart, is, according to Anstie, to do the work of a true stimulant, bringing action up to the normal standard on the one hand, and reducing it to that level on the other."

In illustration of these views, Dr. Murray adduces the results of his experience, and he remarks that, in many cases, digitalis has removed irregularity and intermission of the pulse, has

given power to the heart when exceedingly weak, and increased the rapidity of its action. In one case a lady, aged fifty, had suffered for nine years with disease of both aortic and mitral valves, and the circulation was so weak that there was no pulse at the wrist, while dropsy of the legs and abdomen was making fast progress. Under the use of digitalis in doses of ten drops and upwards, the heart began to beat more forcibly, and the pulse returned at the wrist, the dropsy began to disappear, and the patient returned to her usual state of health, which, though not strong, was comparatively good. But she died about a year after this improvement. Dr. Murray has alternated the use of digitalis with the strongest stimulants, and has been astonished at the superiority it possesses as a stimulant. He thinks that there is not a single disease or condition of the heart *attended by weakness* in which digitalis may not be given with safety and benefit. In hypertrophy of the heart, Dr. Murray admits that his experience is not large, but in one uncomplicated case of this condition of the left ventricle without valvular disease, in which the heart's action was rapid, and at the same time forcible, the digitalis failed to reduce this action, and even caused an increase of the symptoms, and the patient almost fainted after trying it for a week. Lastly, as a cardiac stimulant, digitalis reduces too great rapidity of action when this depends on weakness. Thus it appears that the physiological action of digitalis is that of a stimulant, in Dr. Anstie's sense of the term; and that in its therapeutic action it is especially useful in cardiac weakness, whether that weakness be accompanied by extremely slow or extremely rapid action. As a diuretic, Dr. Murray considers digitalis to be at once the safest and best that we possess. —*British and Foreign Medico-Chirurgical Review, July* 1865, *p.* 249.

25.—ON DIGITALIS AS A CARDIAC TONIC.

By Dr. Walter James Henry, Belleville, Canada West.

[The following case illustrates the value of this medicine in heart disease.]

A thin, pale, delicate-looking woman was propped up by pillows in a rocking chair. She was sitting with the shoulders elevated, stooping forwards. The face had a most anxious weary expression, the eyes slightly prominent. There was a slight lividity of the lips and a change of colour in the finger-nails. Respiration was laboured and uneasy, all the accessory muscles appearing in action. She could only speak in a whispered broken manner, with a gasp between each word. From the long continued distress in breathing, the fatigue was so

great that her head would occasionally fall forward on her chest in an uneasy sleep, from which some increase in the dyspnœa would waken her.

The hands were cold and covered with clammy perspiration. The pulse was almost imperceptible in the right side, weak in the extreme when felt and at the same time extremely rapid. It was ascertained to beat 135 in the minute, and was irregular. It could not be felt on the left side for some time. The legs were enormously swelled, and pitted deeply on pressure. Over the dorsum of the foot and at the instep deep lived stains appeared on the skin.

The great dyspnœa prevented a very accurate examination of the chest being made, but the following facts were made out. The left side of the chest was more prominent than the right, and this prominence was greatest in the cardiac region. The heart appeared to beat lower down than usual, and its impulse was noticed over a more extended surface. Palpation detected valvular thrill and peculiar heaving impulse. A loud systolic bruit was very plainly heard, and was loudest near the apex. It was noticed as remarkable at the time that such a disproportionate impulse existed with a weak and irregular pulse.

The physical signs pointed to disease of the mitral valve with regurgitation, and consequent dilated hypertrophy of the left ventricle.

The kidneys had not been acting very freely, but the urine was free from albumen. The bowels had been acted on by medicine. The tongue was slightly coated, but of a deeper colour than natural, and inclining to purple.

There was not much pain complained of. It was chiefly muscular, and referred to the back and shoulders. The dyspnœa appeared to engross her thoughts, and take up all her attention. In fact, her friends were hourly looking forward to her death, as the breathing had become more laboured towards evening.

At my suggestion twenty drops of the tincture of digitalis with the same quantity of the tincture of muriate of iron were given every hour. I sat up with her to superintend the treatment during the night. Beef-tea and brandy were given every half-hour in small quantities as some dysphagia existed.

After four doses of the digitalis had been given, there appeared to be intermissions in the very feeble pulse. The breathing became less rapid, and an attempt at a sigh was now and then made. But she complainad of the hands becoming extremely cold, and looked even more exhausted than before. Recognising the effect of the digitalis, it was suspended for two hours, during which brandy was very freely given, and the tincture of the muriate of iron was administered as before. The

digitalis was then resumed, and given steadily till morning with the food and stimulant.

At eight o'clock in the morning a very decided change for the better was noticed. She could sit up straight in the chair instead of crouching forward. Her breathing was much relieved, and the shoulders did not move as before. The pulse had fallen to 120, and every beat was marked and perceptible. It was now felt without difficulty in the left arm. The eyes appeared to have a brighter expression, and the lips were less livid.

It appeared on looking at the bottles that four drachms of the tincture of digitalis had been given during the night, and a little more than that quantity of the tincture of muriate of iron. As only ten doses of the digatalis had been given, the twenty drops in each dose must have contained twenty-fourminims.

The dose of digitalis was now given only every three hours during the day (19th,) still combined with the muriated tincture. Eggs and milk were now given to relieve the monotony of the beef-tea. In the evening she was found resting her head on the pillow with a stronger and slower pulse. Each dose of digitalis produced a feeling of drowsiness. A number of of fine punctures were made in both legs with a small needle, and warm flannels applied. A quantity of fluid drained away from these punctures during the night.

20th. Has slept comfortably in her chair. Pulse 110; regular and without intermission. The digitalis was now given only every six hours, and the muriated tincture of iron discontinued.

The strength now seemed sufficiently restored to admit of purgatives, and two drops of croton oil were given and followed up by several doses of bitartrate of potash.

22nd. Swelling very much reduced in the extremities. Breathing very much easier. Has slept well during the night. The dose of digitalis was now reduced to ten drops.

23rd. Slept in her bed last night very comfortably. The bitartrate of potash is still kept up every three hours, and is acting well on the kidneys.

There is a still greater diminution in the swelling of the legs.

It is unnecessary to chronicle the further progress of the case. A febrile attack was subsequently relieved, and from that date convalescence was steady. On the 5th August she had been walking in the open air.

The change which a few hours' treatment made in the pulse was remarkable. From being weak, extremely rapid and irregular, it became defined, full, and increased in strength and regularity in twenty-four hours. The greatest effect, however, was upon the respiration—and this may be accounted for by

the digitalis reducing indirectly the congestion of the lung on which the dyspnœa depended.—*Canada Med. Journal, Sept.* 1865, *p.* 98.

DISEASES OF THE ORGANS OF RESPIRATION.

26.—ON THE INHALATION OF ATOMIZED FLUIDS.

By Dr. Beigel, Member of the Imperial Academy for Natural Sciences, and of the Society of Physicians, Paris.

In the *Lancet* of June the 24th Mr. Horace Swete, suggested "that the little tubes now seen in every druggist's window for blowing out a fine cloud of scent, &c., might be utilized for the application of solutions, astringents, &c., to the larnyx, or, indeed, the eye. . . . . This simple instrument," continues Mr. Swete, "seems to me quite as effectual as the elaborate and costly one figured in Dr. M'Kenzie's book as 'Lewin's Pulverizateur.'" This suggestion has long been executed, for the same Dr. Lewin has, in his works on Inhalation, described and figured, besides his large apparatus, a smaller one, which he carries about in his pocket. It consists of two tubes, which by means of a hinge are folded, and when wanted for use are placed at a right angle to each other, so that the fluid which is to be atomized, and in which the vertical little tube is dipped, whilst air is blown in through the other, issues forth according to the principle of insufflation already described.

The apparatus now mentioned is, for private practice, of the greatest utility, and perfectly answers its purpose. But in every well-managed hospital, and particularly in hospitals destined for the reception of patients suffering from diseases of the organs of respiration, an inhalation-room should not be missing, otherwise such an institution will want those appliances which have proved of the utmost benefit in the cure of such patients. Where a small steam apparatus is already present the arrangement can be effected with great ease; but also in cases where an apparatus for compression of air must be procured, the inconsiderable expense would be in no proportion to the benefit derived by it. The principle applied by Windle of Berlin could form the basis for such an arrangement. From the kettle in which the air is compressed a tube would project, running round the walls of the inhalation-room at an appropriate height; and from which branches or arms, with a very fine opening and a stop-cock, must reach into the room. The vessel with the fluid to be atomized can be fixed in a ring from above. This vessel must be made of thick glass, and have the form of a reversed bottle; the lower end of which (corres-

ponding with the neck of the bottle) has a fine opening, placed at a right angle with the opening of the arm, as soon as the vessel (which can be screwed up and down) is put into the ring. By this arrangement the number of patients could be as many as there are arms, and each might inhale a different fluid. I repeat that this is an arrangement which should not be omitted in any well-managed hospital or dispensary. If we consider that by far the greater part of all patients are (so-called) sufferers from diseases of the chest, and that the inhalations in a great number of those diseases are of much greater effect than internal remedies; if we consider that the atomized fluids, according to the statements of renowned authors, are also very serviceable in other diseases—as, for instance, in certain diseases of the eye, and probably also in affections of the ear, &c.,—the force of the above-expressed opinion becomes still more evident.

The inhalations form a real specific in certain cases of hæmoptysis, in cough which is a result of eccentric irritation of the larynx or trachea, in hoarseness and aphonia as consequences of acute or chronic inflammation of the mucous membrane of the larynx. The cure is sometimes effected with amazing rapidity, after many other medicaments have been applied without effect. Of many cases which I have observed, and the publishing of which in full I reserve, I shall here mention a few only:—

Case 1.—A. B., an unmarried lady, consulted me at the end of last year for hoarseness, from which she had suffered for several years, and which was the more unpleasant to her as she sang well and a great deal previous to that affection—a pleasure the deprivation of which gave herself and her friends great concern. The voice was coarse and without *timbre;* the larynx was painful only at the beginning; now it is indifferent to external pressure. Laryngoscopy can easily be effected, and shows only a slight unnatural redness of the mucous membrane of the larynx and of the vocal ligaments. No other inconvenience exists. In course of the affection a great many medicaments were tried, and all without any effect. I applied inhalations of alum (ten grains to the ounce of water). After three applications a striking improvement was observed, which after five was so complete that I discharged the patient, advising her not to sing yet; but after a week she could no longer resist; therefore resumed singing, and sang as before the affection.

Case 2.—C. D., a merchant from Lima, advised by his physicians, left that country and came to England. His suffering consisted in a severe attack of a very troublesome cough, which came on every eight or ten days, and lasted for a day or two, and then ceased. During that time the sputa were tinged with

a good quantity of pure blood. After each attack the patient felt very exhausted. When he came under my observation he was very pale and emaciated; his voice was coarse. The result of physical examination was infiltration of the left apex; otherwise the conditions were normal. Three days after the examination he had a severe attack; he coughed frequently and very severely, and was not ten minutes without coughing; the sputa consisted more of blood than of mucus, and were very copious. The quantity of blood he ejected during the day was about two teacupfuls. I ordered immediately an inhalation of tincture of sesquichloride of iron. The cough did not decrease; but the sputa after the first inhalation were not tinged. The patient inhaled twice a day, and had altogether thirty inhalations. The intervals between the attacks were in the meantime much prolonged. Blood never appeared during the cough, which altogether disappeared when extract of hyoscyamus was substituted for the above-mentioned liquor. The appearance of the patient had very much improved, and after six months' stay in this country he again returned to Lima, whence he has repeatedly written, assuring me of his perfect health.

Case 3.—E. F., a vocalist, had caught a severe cold, in consequence of which he was very often attacked with considerable pain in his throat, of a choking character; he felt besides a burning sensation in the larynx, and his face was covered with perspiration. Each attack lasted about ten minutes, when they disappeared, and returned several times in the course of the day. There was no typical appearance to be observed. The larynx was indifferent to external pressure. The result of laryngoscopy was negative. Blistering, internal application of the acetate of morphia, cannabis indica, opium, and iron were had recourse to, but without any effect. I applied the acetate of morphia by means of inhalation (half a grain to an ounce of distilled water), and the effect was a perfect cure after ten applications.

In conclusion I shall proceed to make a few remarks *on the medicaments I used for inhalations.* Generally speaking every chemical body which is soluble can be atomized, and therefore inhaled. The largest number of remedies contained in the Materia Medica, can, therefore, be used for the local therapy of the respiratory organs. But it must be borne in mind that, besides the local effect, the medicaments are much more readily absorbed through the mucous membrane than they are by internal application—a fact which must be taken into consideration when the dose is decided on.

The following medicaments are those mostly recommended and found beneficial by practitioners engaged in treatment by

inhalation, and which I can recommend from my own experience :—

1. In inhalatory treatment of the respiratory organs, nitrate of silver deservedly occupies the first place : its dose is three to five or ten grains in one ounce of distilled water. It is particularly serviceable in inflammatory conditions of the pharynx and larynx. The strength of the solution, the frequency of the sitting, and the duration of the same, must be adapted to the nature of the particular case. It need scarcely be mentioned that proper care must be taken if strong solutions are inhaled.

2. Much milder in its effects is nitrate of aluminium, which, as far as I am aware, was first used by myself in inhalations. I prepared it from a simple solution of the metal in nitric acid : working the crystals in distilled water repeatedly, condensing the solution by evaporation, and recrystallizing. It rendered great service, not only in inflammation, but also in nervous affections of the larynx and trachea. The dose is three grains in an ounce of distilled water.

Very useful medicaments are the following :—

3. Tannin : three grains to eight or ten grains, in an ounce of water.

4. Alum : four grains to ten or fifteen grains, ditto.

5. Solution of sesquichloride of iron : one minim to five or ten minims, ditto.

6. Corrosive muriate of mercury : four grains to one or two, ditto.

7. Acetate of lead : a grain and a half to eight grains, ditto.

8. Sulphate of zinc : half a grain to five grains, ditto.

9. Common salt, which has long been considered a most useful agent in the treatment of diseases of the organs of respiration. On the supposition that it was present in the atmosphere near the sea and saline springs, physicians have been in the habit of sending thither patients affected with chest diseases ; and to give the full benefit of it to those who were not able to travel, it had always been the object of physicians to create an artificial *sea-air*. But it is only since the invention of the inhalation apparatus that this desire could be fulfilled. The application of common salt for the purposes of inhalation is therefore very extensive, and produces very marked effects. I make use of it in doses of from five to ten or twenty grains to an ounce of water ; and can assure its efficacy, particularly in diseases of the lungs and windpipe.

In nervous affections, particularly of the larynx, and also for asthma, narcotics have been used ; especially—

10. Tincture of opium, one to ten minims in an ounce of water ; and the preparations of opium.

11. The salts of iodine, bromine, chlorine, and some others.

Authors report the good effects of arsenic in the shape of Fowler's solution, and in a dose of half to five minims to an ounce of water. Lastly, besides the different mineral waters, there must be mentioned—

12. Pure or distilled water, cold or warm, or even as hot as the patient can bear it. It renders, in many cases of inflammation and paralysis of parts of the larynx, great service.

On inhalations of different gases, which likewise are most effectual remedies, if applied to the proper cases, I intend to treat separately at a future time.—*Lancet, July* 29, 1865, *p.* 114.

27.—A SUGGESTION IN AID OF LARYNGOSCOPY.

By Dr. George Johnson, Physician to King's College Hospital, Professor of Medicine in King's College.

[There is generally a painful glare of light in the eyes of the laryngoscopist.]

Everyone who has worked much with the laryngoscope must have experienced the unpleasant effect resulting from continued exposure of the eyes to the glare of light. So long as the operator looks through a perforated reflector placed in front of one eye there is no mode of escape from the annoyance in question. It may be avoided entirely by the simple device of a black shade over the eyes, the shade being placed beneath the reflector on the forehead, and fastened by two hooks and eyes to the band which passes round the head. The shade is made of a piece of card covered with black silk. The eyes are sewn on the elastic band which holds the reflector, that on the right being fixed on the *inner* side of the buckle, so as not to interfere with the movement of the band through the buckle. The hooks —such as ladies use for holding up their dresses—are attached to the upper edge of the shade, one near each end. The shade therefore can be quickly attached to the band, and as readily removed.

The effect of the shade is to protect the eyes entirely from the direct glare of the sun or of the lamp, while the light is reflected from the laryngeal image, with much less of fatigue and annoyance to the eyes than in the ordinary mode of practising laryngoscopy. When a lamp is used, its flame should be about the level of the top of the patient's head. The shade must be sufficiently wide to protect the eyes from the direct glare of the lamp or of the sun, without obstructing the rays reflected from the laryngeal mirror. The shade can be made and fixed without the help of an instrument-maker, and I commend this simple contrivance to the notice of my fellow-workers in the interesting field of laryngoscopy.

I see that a recent writer in the *Lancet*, Dr. Eben. Watson of Glasgow, expresses his opinion that the value of the laryngoscope has been over-estimated by some whom he considers too zealous advocates of this new method. With regard to the alleged frequency of polypous and other morbid growths in the larynx, he appears to be sceptical, and "cannot repress the wish that laryngoscopists had these strange visions granted to them a little less frequently." Dr. Eben. Watson apparantly suspects that some of these visions have been of a *spectral* character. He also expresses his opinion that "laryngoscopy is neither required for nor assists in the ordinary topical medication of the larynx, and that it is a most unsafe guide in surgical operations on that organ." The removal of warts from the vocal cords by the aid of the mirror he speaks of as "rather a wonderful feat in surgery," and he evidently doubts the possibility of such a proceeding. I should have thought that the number of well-authenticated cases in which morbid growths in the larynx have been discovered and removed by the aid of the laryngoscope would suffice to convince even the most sceptical that growths in this situation are not uncommon, and that their removal by the aid of the mirror presents no insuperable difficulty. I have myself within the last two months removed a tumour from one of the vocal cords in no less than three cases. I have the morbid growths to show as evidence that "this rather wonderful feat" has been accomplished, and I shall shortly publish full particulars of the cases. In not one of these cases could the cause of the hoarseness have been ascertained without the aid of the laryngoscope, much less would it have been possible to carry out a successful plan of treatment, resulting, as it has done in each case, in the complete restoration of the voice.—*Lancet, Aug.* 26, 1865, *p.* 230.

DISEASES OF THE ORGANS OF DIGESTION.

28.—ON FLATULENCE AND ITS SUCCESSFUL TREATMENT BY A NOVEL USE OF CHARCOAL.

By Dr. Arthur Leared, M.R.I.A,; Senior Physician to the Great Northern Hospital, and Physician to the Royal Infirmary for Diseases of the Chest.

Charcoal is not unfrequently prescribed in cases of flatulence, but the conditions necessary for success are not fulfilled. These are, that it shall be taken into the stomach dry and in a fresh state.

Some twenty-five years ago Dr. Belloc, a retired French officer, turned his attention to charcoal as a remedy for dyspepsia. He was himself a sufferer and had thus an opportunity of personally

testing its action. He decided after many trials that charcoal made from poplar wood is the best. He found that the charcoal of some other woods caused a disagreeable taste in his mouth —even painful excoriations of the mucous membrane—thirst, and a pinching sensation at the pit of the stomach. He was in the habit of prescribing from two to six tea-spoonfuls, but says he has himself taken as much as 500 grammes—more than fifteen ounces in a day. The Académie Nationale de Médecine reported very favourably on a memoir Dr. Belloc published on the use of charcoal, and in France it soon became a favourite remedy. Its reputation spread to this country, and now we find charcoal lozenges, and even charcoal biscuits, sold as dyspeptic remedies. Belloc's charcoal is in the form of a moist powder. He advised that it should be taken stirred up in water. In this country charcoal is occasionally prescribed in mixtures. The biscuits and lozenges must of course be thoroughly impregnated with saliva to enable them to be swallowed. Now, charcoal taken in any of the above modes always seemed to me of little efficacy. My device was to give the ordinary wood charcoal freshly prepared and hermetically sealed in gelatine capsules. Nothing could have been happier than their effect in the case I have referred to. Three or four capsules were sufficient to give complete relief each time. Nor is it often that the objective evidence of beneficial action is so plain. When the sound on percussion over the greater end of the stomach was quite tympanitic, this would completely subside into the ordinary clear tone of the part after the capsules had been swallowed a few minutes.

Encouraged by this case, the capsules were given in many other instances with excellent results. A series of experiments were now commenced with a view to determine what kind of charcoal was best for the purpose, and whether the matter admitted of further improvement.

The power of absorbing effluviæ possessed by charcoal had been known for ages, but its action upon different gases was first tested by M. Lowitz towards the close of the last century. The subject was pursued by Count Morozzo and afterwards more fully by M. Saussure. He used boxwood charcoal exclusively in his experiments, and found that a single volume of it absorbed the gases which possess a present interest in the following proportions :—

Sulphuretted hydrogen	55
Carbonic acid	35
Oxygen	9·2
Nitrogen	7·5
Carburetted hydrogen	5
Hydrogen	1·7

The able researches of Dr. Stenhouse, published in 1855, greatly increased the interest in the subject. His experiments were mainly directed to the deodorizing qualities of charcoal, and he proved beyond question that its properties of destroying the smell of putrid animal or vegetable bodies depended, not, as had been previously supposed, on its antiseptic power, but on the very opposite quality of absorbing and oxidising effluviæ. Several others have since that time investigated this absorbent action, and Mr. Hunter has recently published an account of his experiments, showing the relative amount of various gases taken up by different kinds of charcoal.

He found that charcoal made from cocoa-nut shells possessed most power, and deduced a general rule that charcoal made from the harder woods was much superior to that from the softer. It may be added here, that animal charcoal, so useful as a decolorising agent, is very inferior as an absorbent.

In my own experiments, the gases were collected by displacement in the usual way. By a simple arrangement, the amount of absorption was determined by the quantity of mercury which flowed into, and was retained in the vessel containing the gas, into which the charcoal had been introduced. As the experiments have had a practical aim, they differ in some respects from those conducted by the purely scientific chemists. The gases were not dried, since in the moist state they more closely resemble those of the alimentary cavities, and combinations of other substances with charcoal were tried in the hope of discovering a still more effective absorbent than simple charcoal. The experiments have been very numerous, but it has not been thought desirable to encumber the table with more than seem necessary to elucidate particular points; and as the absorption of carbonic acid possesses by far the most interest, this has alone been given. The absorbent action was instantaneous, and about seven-eighths of the whole was completed within two minutes. The time allowed for each experiment was an hour, but absorption continues at a slow rate for many hours. To obtain good results the charcoal must be exposed to a high heat in a crucible, until gas no longer escapes: and it would seem that charcoal newly made is superior to that which has been re-ignited.

From the table given below the following deductions may be made:—Charcoal made from the most solid vegetable substances is greatly superior as a gas absorbent to that made from the lighter kinds, like Belloc's preparation; and that made from vegetable ivory is the best.

The absorbent power of charcoal is slightly weakened by pulverization, is much impaired by exposure to the atmosphere

and damp, or by soaking in water, and is altogether impeded by being covered with water.

Table showing the Absorption of Carbonic Acid Gas by Twenty Grains of Different Kinds of Vegetable Charcoal.

	Experiment.	Mean.
Vegetable ivory nut in small fragments, freshly ignited	2·26 2·26 2·20	2·25
Vegetable ivory, finely powdered and freshly ignited	2·20 2·20 2·12	2·17
Vegetable ivory, freshly ignited and ammoniated	2· 1·19 1·94	1·95
Vegetable ivory, platinized (2 per cent.) ...	1·74	1.74
Vegetable ivory, freshly ignited, soaked in water	1·36 1·32 1·24	1·30
Vegetable ivory, freshly ignited, covered with a layer of water	0·0	0·0
Coquilla nut, freshly ignited	2·0 1·94 2·4	1·99
Cocoa-nut shell, freshly ignited	2·0 1·98 1·92	1·97
Acacia, freshly ignited	1·80 1·88 1·94	1·87
Peat, freshly ignited	1·80 1·66 1·82	1·76
Belloc's, freshly ignited	1·82 1·80 1·70	1·77
Belloc's as sold, without ignition	·68 ·66 ·66	·67

Charcoal, to be effective against gastric flatulence, must be introduced amongst the gases of the stomach in the same state as when fresh from the crucible. The means for effecting this, enclosing it in gelatine capsules, so that it may be set free in the stomach by solution of the gelatine, has been already described.

It may also be infered that, as the absorbent action is pro-

tracted and is not destroyed by being wetted, charcoal may still prove beneficial when it has passed into the intestines.

Charcoal, by virtue of its porous nature, takes up gases mechanically as a sponge takes up water. Its capacity in this respect is in proportion to the number and fineness of its pores. Charcoal made from vegetable ivory or cocoa-nut shell is a compact, heavy substance, having a metallic lustre and ring, the pores being quite invisible.

This kind of charcoal, then, is best adapted to the present purpose. It should, in the first instance, be carefully prepared by sufficient ignition, and when about to be filled into the capsules should be powdered and re-ignited in a crucible. I have as yet no clinical experience of the ammoniated charcoal; but when the alkali is indicated it will probably be found the best. Charcoal impregnated with chloride of platina has been recommended as an absorbent by Dr. Stenhouse, but it did not answer my expectations.

An experiment conducted for me by Mr. Robbins, to whom I am indebted for much valuable aid, shows how necessary it is that good unsaturated charcoal should be used.

An iron bottle, to which a long tube of the same material was adapted, was filled with twelve ounces of ordinary medicinal charcoal and placed on a strong fire, A glass tube, tapered at the free end to a very small size, was adapted by means of india-rubber tubing to the free end of the iron tube. As soon as the charcoal ignited, gas began to issue from the glass tube and continued to do so for about two hours. It could be ignited, showing the presence of carburetted and other inflammable gases. It is possible that the excess of gas was partly due to the charcoal not having been well made, and it certainly shows the necessity for caution in selecting the article for use.

Charcoal always contains oxygen, because, when taken from the crucible, it immediately obtains it from the atmosphere, and its affinity for nitrogen is much less. It may here be remarked that this easy separation of its component parts goes to prove that the combination of oxygen and hydrogen in common air is purely mechanical.

Charcoal has a different point of saturation for every gas, but when filled with one or more it is still capable of absorbing other gases. Thus, coarse-grained charcoal saturated with ammonia takes up more carbonic acid than charcoal without ammonia; and the same charcoal when saturated with both takes up a larger quantity of sulphuretted hydrogen than of either. This is a valuable property where, as in the case of the intestinal cavity, the gases are various. Much is still to be learned about it; but the reason why charcoal saturated by

ammonia takes up carbonic acid so freely is plainly due to the formation of carbonate of ammonia. The impregnation of charcoal with oxygen has important therapeutic actions. It is this which renders it so valuable an agent in destroying the fetor of foul sores, and, when taken internally, of correcting any putrefactive tendencies; and it is also by virtue of this that sulphuretted hydrogen is not only absorbed but immediately decomposed.

The gelatine capsules employed are of two kinds—those ordinarily used for taking liquid medicines, and those made in separate portions which fit into each other; in either case care is taken that they be hermetically sealed with gum or liquid gelatine as soon as filled. The limit of size for the capsules must, of course, be determined by the individual capability of swallowing them. The largest contained only five grains of the light charcoal at first used, and found so efficacious in the case mentioned, but the same capsule will contain more than ten grains of the heavy kind; thus a relative as well as an absolute advantage is gained, for the heavy charcoal possesses much higher absorbent powers.

Charcoal taken in large doses presents one great disadvantage: intestinal obstruction, as in the case of magnesia, has sometimes been the consequence. Now, the table proves that vegetable ivory charcoal freshly ignited is three times more effective than Belloc's damp charcoal. But this superiority must be still greater in consequence of the mixing with water preparatory to Belloc's charcoal being swallowed; and if it sink in the fluids of the stomach, which, should any be present, it inevitably will do in consequence of the saturation, its efficacy will be altogether destroyed. But granting that charcoal taken in the ordinary way has a certain absorbent power, a very large dose will be required to equal the activity of a single capsule of the heavy charcoal.

It may be objected that, although charcoal be swallowed in hermetically-sealed capsules, it must necessarily undergo liquid saturation as soon as set free in the stomach. But charcoal, not being easily wetted, will float on the surface of its contents; and to test its capability of absorption when in this position I tried the following experiment:—

Into a receiver containing carbonic acid a little warm water was introduced; a capsule of heavy charcoal was then put into the receiver. The gelatine having been dissolved by the water, its contents were set free in about a minute, and the charcoal floated on the water. Absorption now proceeded actively.

The number of capsules to be taken must vary with the greater or less severity of the flatulence, but three or four will generally be found sufficient. It is not advisable to drink while

swallowing them, but the process may be aided by eating a small piece of dry bread.

Twenty grains or two capsules, of the vegetable ivory charcoal absorb more than two cubic inches of carbonic acid gas, which ought to be sufficient to reduce any ordinary distension of the stomach. If a greater effect be desired, and the dose be increased to four capsules, nearly five cubic inches will be taken up. Now, admitting that these effects are not quite so active in the stomach as they are in the experiments, there must still be absorption enough to give relief to the patient. The effect may at any time be tested and the repetition of the dose guided by percussion over the greater end of the stomach. More charcoal should be taken as long as the percussion sound is tympanitic.

The beneficial action of charcoal need not be confined to the human subject. I have suggested its use in appropriately-sized capsules for flatulence in horses, and also as a remedy for that frequently fatal distension of the first stomach from carbonic acid which occurs in cows after certain food, such as clover and potatoes, and hope soon to hear of their successful application.—*Medical Mirror*, *June* 1865, *p.* 315.

29.—ON THE ASSIMILATION OF SUGAR BY THE LIVER.

By Dr. F. W. Pavy, F.R.S., Assistant Physician to Guy's Hospital.

From Brücke's analyses, which have been confirmed by Dr. Bence Jones, it seems that healthy urine contains a trace of sugar. I had premised that this should be so without knowing anything of Brücke' experiments and before Dr. Bence Jones' were made known. Looking at the diffusibility of sugar, and the fact that a minute quantity of it exists always in the circulation, I expressed myself thus in one of my Lettsomian Lectures which appeared in the *Lancet* for December 22, 1860:—"I should say, even, that the trace of sugar, which is natural to the blood throughout the body, is constantly being drawn upon by the kidney; but that the amount for removal is so small that if it is not susceptible of detection in the urine. Did we possess more perfect means of detection than we do, I imagine a minute trace of sugar would be reckoned as a normal constituent of the urine."

It is a curious coincidence that Dr. Bence Jones' communication was read at the Chemical Society the very evening the number of the Lancet containing the above was passing through the press. Dr. Bence Jones, writing quite recently (Medical Times and Gazette, January 21, 1865), again states that he has

satisfied himself by the most careful investigation that Professor Brücke is right in saying that healthy urine contains sugar.

Now, accepting it as proved that healthy urine contains a trace of sugar, I look upon such a fact as affording one of the strongest arguments that could be brought forward against the validity of the glycogenic theory. It is admitted that no appreciable destruction of sugar takes place in the lungs: therefore, whatever sugar is poured into the circulation from the liver and reaches the right side of the heart will also be found in the arterial system. It must hence be conveyed in due proportion to the kidney, and, on account of its diffusibility, must be in part eliminated with the urine in compliance with the laws of osmosis. Now, if from the minute quantity of sugar naturally existing in the blood, sugar can be shown to exist to a minute extent in the urine, what, it may be asked, would be the condition of the urine if the blood of the right side of the heart were strongly impregnated with sugar as was formerly supposed? I confidently assert that, under such a state of things, we must all have been diabetics. The state of the urine forms an index of the amount of sugar existing in the circulation; and let sugar to any considerable extent reach the general circulation, and it will be sure to determine a correspondingly saccharine condition of the urine.

Dr. Bence Jones, in his recent lectures in the Medical Times and Gazette, treats of diabetes as a disease of suboxidation. He seems to have carefully avoided saying anything about the subject of glycogenesis either one way or the other. After enumerating the different kinds of saccharine substances, and stating that they are not all able to pass as glucose into the urine, he says, "but they are all capable of being oxidised in the blood and textures into carbonic acid and water, whilst giving heat or motion or other energy to the body." Now, if from this we are to infer that Dr. Bence Jones is of opinion that the sugar we consume reaches as such the general circulation and undergoes oxidation as it is contained in the blood and is passing through the textures, I think his corroboration of Brücke's analysis stands directly opposed to him. I maintain that the trace of sugar encountered in healthy urine comes by the simple law of diffusion from the minute quantity of sugar always encountered, no matter what the diet, in healthy blood. The presence of this trace of sugar in healthy urine proves that the capacity for the destruction of sugar in the blood cannot be very great. Now, suppose saccharine food to be ingested, and that the sugar reached the general circulation; it would be carried to the kidneys as well as elsewhere, and what would be the condition of the urine under these circumstances? The ingestion of sugar, unless in very large quantity, does not give

rise to the presence of sugar, such as is capable of being recognised by ordinary testing, in the urine; but I contend it would do so if the sugar reached the general circulation. Dr. Bence Jones treats of diabetes as a disease of suboxidation, and speaks about the oxidation of sugar in the system as though such a process had been actually proved to occur. He, however, adduces no evidence, and I must confess I am aware of none, that can be taken as showing that the sugar we consume is disposed of by undergoing direct oxidation in the body.

Indeed, my experiments, to which I will now refer, show that sugar is transformed by, or undergoes its first step of, assimilation in, the liver. I have found that from sugar amyloid substance is produced in the liver.

I think it may be looked upon as established that sugar derived from without is transformed by the liver into amyloid substance. It may be considered that we have here the first step in the assimilative process to which sugar is subjected in the animal economy; and should this step fail to be accomplished, the sugar would pass through the liver; and, reaching the general circulation, would occasion diabetes. But I do not say that sugar is the only source of the amyloid substance. It is quite certain that it is not so. There is still amyloid substance in the liver, notwithstanding saccharine and amylaceous materials may have been altogether excluded from the diet. I believe that the liver is capable of forming amyloid substance from the products of the retrograde metamorphosis of assimilated animal food and worn-out tissue. By this, materials would be brought into a condition for being turned to account in the system, instead of being discharged as useless.

I must not omit to refer to a property enjoyed by the amyloid substance which enables it to be retained in the liver cells, so that the gradual assimilative influence of the organ may be exerted upon it. Sugar, as I have already stated, is a substance enjoying great diffusibility. With its diffusibility, we may say it would be physically impossible that it could exist stored up in the liver cells whilst a current of blood was flowing through the capillaries around. In the amyloid substance, however, we have a body directly opposed to sugar in respect of diffusibility. It refuses altogether to pass through the vegetable parchment or thick animal membranes. Hence it has no disposition to escape from the liver cells, and the circulation can take place around without carrying it away. Should it reach the circulation and be mingled with the blood it would be immediately transformed into sugar and occasion saccharine urine.

Having thus shown that sugar is transformed by the liver into amyloid substance, the next step is to determine into what the amyloid substance is converted. Upon this point, I will

simply tell you that Dr. McDonnell has recently enunciated the opinion that it is united with nitrogen, and leaves the liver through the hepatic veins as a newly-formed proteic compound, partly, perhaps, he says, as globuline, and partly as a material in its reactions resembling caseine or albuminose. From the philosophical reasoning adopted, Dr. Mc'Donnell's opinion is entitled to consideration, although I must confess my own investigations have led me to look in another direction for the product of the metamorphosis of the hepatic amyloid substance. It is due to Dr. McDonnell, however, to admit that as yet I have obtained no data sufficiently precise to justify me in entertaining anything more than a surmise upon the matter.

Diabetes I look upon as the result of a defective assimilating action of the liver. If the cases that fall under observation be attentively examined, they will be found to present considerable variation. In some a perfect exclusion of saccharine and amylaceous materials from the diet may be made, and still the diabetic shall pass a considerable quantity of sugar. I should say here that the saccharine principle comes from the unnatural transformation into sugar of the amyloid substance formed by the liver from products derived from animal food, and from the wear and tear, or disintegration of the tissues. In others —and this is the kind of case that is especially met with amongst elderly people—sugar disappears from the urine when restriction from saccharine and amylaceous articles of food is practised. Here there seems to be simply a want of power to assimilate the sugar and starch ingested. In a healthy person, when sugar and starch are taken, they are lost sight of in the system, because there is the power to transform them, so that they may be to the service of the economy. In such a diabetic, however, as I am now picturing to you, whatever sugar and starch may happen to be ingested will pass through the system and be eliminated with the urine, because there is the want of power to assimilate or transform them so that they may be turned to account in the economy. In other cases, again—and these are not so rare as perhaps may be thought for—there is the power to utilise a certain amount of sugar and starch, and this may be taken without occasioning the presence of sugar in the urine, whilst if the certain amount be exceeded sugar is immediately to be recognised in the urine.

I have met with several cases of the last form of diabetes that I have described to you. Such patients have come to me as ordinary diabetics. The diet has been restricted so as to exclude sugar and starch from the articles ingested. The sugar has disappeared from the urine, and after a time it has been found that a certain amount of ordinary bread and potatoes may be taken without rendering the urine saccharine. An

excess, however, immediately affords evidence that the complaint has not completely disappeared. In one case—an exceedingly instructive one—the patient regarded himself as completely cured. He was able to take a mixed diet without passing sugar with his urine. All that was required to be attended to was, moderation in the consumption of bread and such-like articles of vegetable food. At an evil moment he was tempted to drink some cyder. Being thirsty, he drank off a pint; and within two hours, from the sweet taste experienced in his mouth, he felt sure his complaint had returned. His urine he soon afterwards brought to me to be examined, and the result showed that his suspicions were well founded. This patient, although several weeks have now elapsed, has never since been in so favourable a state as before. At first, notwithstanding that he fell back upon the restricted diet, sugar was present in the urine; and now, although there is no sugar under it, yet he cannot deviate from it without passing saccharine urine. It is hence evident how easily a relapse may be brought about by indiscretion in what is taken, where it may be even imagined that a complete cure had been effected.

The point remaining to be attained in the pathology of diabetes is to go one step further than we have done and ascertain the cause of the sugar failing to undergo assimilation as it ought to do. It has been for a long time known that puncture of the fourth ventricle produces a temporary diabetes. This has not, however, helped us to unravel the nature of diabetes, because it cannot be definitely stated in what way the effect is produced. Some years ago I discovered that injuring certain portions of the sympathetic system will likewise produce diabetes. A paper upon this subject appeared in the Guy's Hospital Reports, for 1859. I found that injuring, amongst other parts, the superior cervical ganglion of the sympathetic rapidly produced a strongly saccharine state of the urine. At first each time I experimented upon this ganglion I obtained the diabetic result. Somewhile afterwards, on several times repeating the experiment, I was surprised to find that if I obtained any effect it was but a very slight one; nothing to be compared to what I had obtained before. I have been at a loss to account for this difference until recently, when it occurred to me to use the fumes of puff-ball as an anæsthetic, instead of chloroform, whilst performing the operation.

I was in no doubt about a strongly-marked diabetic effect having been produced in my early experiments. In one case, indeed, I observed as much as $20\frac{1}{2}$ grains of sugar to the fluid ounce in the urine within half an hour after the operation; and in another 34 grains to the ounce in less than two hours. I was not conscious that I operated differently to what I had done

before; but yet there was the difference in the result. Reflecting upon the alteration which the administration of chloroform produces upon the calorific effect resulting from the division of the carotid portion of the sympathetic in the neck, it occurred to me as possible that the administration of chloroform might exercise an influence upon the result of my experiment. I cannot say whether I used chloroform in a manner to produce so full an anæsthetic effect in my early experiments as I do now. At all events, I have recently substituted for chloroform the smoke of puff-ball as an anæsthetic agent, and have found in several experiments that injuring the superior cervical ganglion has been followed, without exception, by the rapid production of strongly saccharine urine.

The inference first natural to be drawn was that the artificial diabetes was occasioned by an alteration in the state of the blood-vessels connected with the liver. I therefore resolved to ascertain how such an inference would stand when submitted to the test of experiment. I tied the hepatic artery, and still found that saccharine urine resulted after operating on the sympathetic. In one hour's time the urine contained $8\frac{1}{2}$ grains, and in two hours' time 12 grains of sugar to the ounce. After ligature of the cæliac axis, also, sugar has appeared to nearly the same extent in the urine. One hour afterwards there were 7·38 grains, and three hours afterwards 6·66 grains to the ounce. After ligaturing the portal vein as well as the hepatic artery, as was to be expected, there is no appearance of sugar in the urine.

With these experiments I do not see how it is reconcileable that the effect of the operation on the sympathetic can be in a direct manner attributable to an action upon the blood-vessels. It is only upon the coats of the arteries that we can conceive the sympathetic to exert any material direct influence, it being through the muscular element that it influences the circulation. Possibly the operation on the sympathetic may lead to an alteration in the quality of the blood that is passing to the liver, and so occasion the result. This is the most likely supposition that I can offer at present. Tying the portal vein so as to allow a stream of arterial blood only to pass through the liver occasions a saccharine condition of the urine; and injecting carbonate of soda into the circulation previous to operating on the sympathetic prevents the production of saccharine urine. Hence some justification is afforded for looking to the state of blood to supply the explanation required. The effect of the carbonate of soda thus ascertained by experiment in checking the production of saccharine urine after operating on the sympathetic tallies with the known therapeutic influence of the Vichy waters in diabetes.—*Med. Times and Gazette, June* 3, 1865, *p.* 565.

30.—ON A CASE OF TAPEWORM (TÆNIA SOLIUM) TREATED SUCCESSFULLY WITH THE OIL OF MALE FERN.

By Dr. John Constable, Leuchars, Fifeshire.

[The patient passed two joints of tapeworm owing to the action of a purgative.]

I then ordered the following mixture, which is as nearly as may be, the formula recommended by Dr. Fleming, of Birmingham, in his Report to the British Medical Association—viz., oil of male fern, three drachms; mucilage, an ounce and a half. Half of the above to be well mixed with half a cupful of sweet milk, and to be taken on an empty stomach at bedtime, to be followed by half an ounce of castor oil in the morning.

These directions were observed to the very letter, as the patient was most anxious to get rid of "these worms," which had caused her so much annoyance, and brought her into such bad health.

On the 21st of December she took no food after breakfast. At six p.m., she felt so very hungry that the temptation to partake of food was almost irresistible. However, as a compromise, she took the mixture as prescribed, and went to bed. In a few minutes she felt very sick and inclined to vomit; and a peculiar benumbed sort of feeling crept over her body, and particularly up the sides of her head. There was, however, no vomiting, nor even retching; but the nausea and sickness continued. In about twenty minutes after taking the medicine she felt a peculiar and remarkable sensation over the region of the stomach—a sudden starting, or, as she expressed it, a sudden and sharp "dirking," which lasted only a second or two. The sickness, however, continued till midnight, when it gradually wore off. There was no griping at all. At six a.m., and before taking the castor oil prescribed, she felt an inclination to go to stool. A small quantity of fæces came away first, and then a large tapeworm, coiled up in a ball about the size and shape of a hen's egg, and dead. On being uncoiled and measured, it was found to be exactly twenty-two feet two inches and a half long. There was a smaller piece, also, in addition, which was detached from the rest, and measured about six or eight inches. This broke up into several pieces; and the patient, thinking it of no consequence, threw it away. The larger piece, however, was brought to me, and I have preserved it. I have no special knowledge of helminthology, but I think it is a specimen of the tænia solium. The following are its measurements:—As already stated, twenty-two feet two inches and a half in length. The breadth of the first foot is

one-eighth of an inch, and contains ninety-five joints; the breadth of the second foot is a quarter of an inch. At the broadest part it measures half an inch, and there are thirty-one joints in a foot; and at the end it is three-eighths of an inch broad, and contains only fifteen joints in a foot. The *head* was not found.

In three days afterwards I ordered the patient to take the second half of the mixture prescribed, with the same directions as formerly. She experienced the same physiological effects of the medicine, but in a more intensified degree. This time there were decided griping pains, and more sickness and nausea, but no vomiting; more purging, pain on micturition, a sick headache, and the same benumbed sensation up the sides of the head. Castor oil was also taken in the morning, and there were copious evacuations, but no more joints were passed.

For some month previously to consulting me, Mrs. B. had been in a very unsatisfactory state of health. She had pain in the stomach after food, and especially after breakfast; dull headache; giddiness; a feeling of coldness over the abdomen, with occasional swelling and griping in the region of the stomach; was generally sleepy and heavy after any exertion, and disinclined to work; there was a constant itching at the nose and the anus, and intensely at the latter when the joints "wriggled" themselves away. The appetite was at times very voracious: she was generally obliged to eat something at five a.m., to satisfy the cravings of hunger. She states that she had no thirst during these months, and that the bowels, formerly costive, assumed latterly an opposite tendency.

On being questioned as to her food, she admits having eaten pork, and remembers distinctly having eaten in the beginning of 1864 a small piece of dried ham *raw*. This, in all probability, contained the cysticercus from which this tapeworm became developed. She further states that for some time she has been particularly fond of *salt* herrings, and that several joints invariably passed after eating them.

The patient's health has improved every day since this tapeworm was passed. She feels as if a burden had been taken off her; her spirits, formerly low, have greatly improved; the capricious appetite has been removed; the dull sick headache has gone; and she says she is "altogether a new creature."

It is to be hoped that the *head* of the worm was on the slender detached piece which was unfortunately not brought to me, and that a tonic treatment will prevent a return of the patient's distressing symptoms.—*Lancet*, *May* 27, 1865, *p.* 565.

31.—ON AZOTURIA.

By Dr. Edward H. Sieveking, Physician to H.R.H. the Prince of Wales, and to St. Mary's Hospital, &c.

[It is impossible for physicians to devote too much care to the investigation of cases of dyspepsia and anæmia. These terms cover a multitude of diseases, which a greater refinement of diagnosis would readily reduce to some other denomination.]

While admitting the imperfection of my analyses, I cannot but think that, if we find a patient habitually passing urine of a high specific gravity, averaging 1030, and not due to the presence of sugar, nor associated with albumen, and proved to contain a very large amount of urea, we are justified in terming his case one of azoturia; the more so, if on close inquiry, no tangible disease can be detected to which the accompanying symptoms are referrible.

It has been my lot to have met with numerous cases of protracted indisposition, accompanied by defective powers of assimilation, irregular digestion, debility, general and indefinable *malaise* and more or less emaciation, though this not always, in which I held the excessive waste of the nitrogenous tissues, as indicated by the increase of urea in the urine, to be an adequate explanation of all the phenomena. The diagnosis was, in part, attained *par voie d'exclusion;* but after satisfying myself of the absence of all other sources of the morbid feelings of the patient, it appeared that a persistent and palpable feature, such as the one alluded to, would justify the application of Willis's term. Dr. Prout *(On the Nature and Treatment of Stomach Diseases*, 1848, p. 94), who gives a description that in most points tallies with my own observations, distinguishes between two forms of the disease; in one of which there is diuresis; while in the other there is an excess of urea without diuresis; and he regards the affection as analagous to diabetes. He considers that he has the strongest presumptive evidence, both from observation and analogy, that, if permitted to proceed unchecked, or if injudiciously treated, it passes into diabetes or some other formidable disease, though he has no positive proof of such termination.

I have at present under observation the case of a gentleman, in whom there is an alternation of azoturia and glycosuria; though, in neither case, is there a secretion of urine justifying the term diabetes. The amount passed rarely exceeds three pints in the twenty-four hours; but, while at times the urine is almost solidified by the addition of equal parts of nitric acid, owing to the formation of nitrate of urea, at others it is found to contain a palpable amount of sugar, as confirmed by the exami-

nation of my friend, Dr. Matthiessen, the lecturer on Chemistry at St Mark's Hospital.

I have shown elsewhere, that an excess of urea is, as was already shown by Dr. Prout, a frequent accompaniment of epilepsy—an exhaustive condition which might have been predicted *à priori*, if *à priori* reasoning were of any value in determining natural phenomena. The occurrence, however, is not uniform; in fact, it fails with sufficient frequency to have induced one writer to assert that the characteristic feature of the urine in epilepsy was an absence of urea. Dr. Parkes, in his admirable work on urine, states that he has never met with a case of genuine azoturia, though he admits the possibility of its occurrence, as he quotes a case examined by Dr. Ringer, in which a man who was not febrile, and only appeared feeble, passed no less than 1130 grains of urea in each twenty-four hours, or about three times the average secreted by an adult male. It is of such cases, and not of the coincident occurrence of an excess of urea in other diseases, as in epilepsy, that I am now speaking; and I cannot but think that, were a special series of volumetric analyses undertaken to determine the point, the view originated by Prout would receive more positive support than it yet has, and azoturia would be definitively accepted as a member of the nosological fraternity. It is possible that Golding Bird, who laid what I should regard as an undue stress upon the presence of oxalates in the urine, because they come and go like will-o'-the-wisps, often spoke of cases of azoturia when he discussed his hobby oxaluria. He admits that, in oxalic urine, the density increases with the quantity of urea, which is often present in large excess. Indeed, he continues, "I regard the presence of a greater or less excess of urea almost as characteristic of the morbid state of the urine for which I am contending, as the oxalate of lime itself." (*Urinary Deposits*, 1857, p. 241.) Without controverting Dr. Bird's statement, I may state that in the cases of azoturia as I have observed them, this balance between oxalates and urea has not presented itself; and, in fact, I may say, that the oxalates have but rarely occurred with the excess of the latter substance.

The following is a case to which I should apply the term, azoturia.

A gentleman, aged fifty-three, but looking much older, consulted me in January, 1861. He had always been very temperate, and had enjoyed good health till after an affray with poachers ten years previously, when he had an attack of jaundice. He recovered from this, and remained well till, four years ago, he became subject to bilious attacks accompanied by irregular action of the bowels. Three years ago, after much annoyance and mental excitement, he suffered from carbuncle

on his back. Since that time he had been in bad health; suffering from a feeling of numbness in the left leg, and occasional severe attacks of diarrhœa. He complained of occasional neuralgic pains, and at times entire absence of sensation in the left foot. He walked into my room like a man debilitated by disease, but in no way resembling a paralytic. He complained of having been affected with seminal emissions. I examined him very carefully afterwards in bed, and could find no trace of loss of parallelism or loss of motor power. I could not satisfy myself, by the æthesiometer, of any material impairment of tactile sensibility; no tenderness of the spine and no abdominal derangement were traceable; nor was there any disease of the rectum or prostate. I commenced the treatment with steel, and the application of an anodyne liniment; and ordered wine, beer, and nutritious food. The patient, being a teetotaller, was with great difficulty persuaded to take any fermented liquors. I obtained a specimen of the morning and evening urine before my next interview, when I had a consultation with a leading physician on the case. Both specimens had a specific gravity of 1035, were strongly acid, exhibited no increase of phosphates, and contained neither sugar nor albumen. There was no crystalline forms in either, and specificially no oxalates; but both specimens almost solidified on the addition of equal volumes of nitric acid, by the formation of nitrate of urea. The joint examination elicited no proof of any organic disease; and it was agreed that the case was one of azoturia. The quantity of urine never was large that was passed in the twenty-four hours; it rarely attained to three pints. I find that on one occasion I had the advantage of obtaining a volumetric analysis from Dr. Ringer; and the estimate was seven drachms and a half in the twenty-four hours—an amount considerably above what Dr. Parkes considers the average in the healthy adult. The gentleman remained under my treatment for three weeks; and improved materially under the administration of mineral acids, opiates, and tonics of various kinds. It was not till after twelve days' observation that I discovered a few oxalates in his urine. In a medical report which I gave the patient at his request, on leaving town, I stated that I regarded the azoturia as the source of debility; and that the drain caused by a persistent waste of tissue, indicated by an excess of urea in the urine, sufficiently accounted for the anomalous nerve-symptoms to which he was liable.

I saw the same gentleman again at the end of 1862, when he was passing through London after he had, without medical advice, been taking the waters of Kissingen, and thereby brought on severe diarrhœa. He was naturally weak in consequence; but the urine presented a specific gravity of 1025—

lower than I had ever seen it formerly, and I have a memorandum that it contained but little urea.

There are many insidious morbid conditions for which we may find an adequate explanation in the urinary secretion, with important hints as to treatment and *regime*. The insidiousness of degenerative renal disease as indicated by albumen, is a point that can scarcely be too often mooted; and it is surprising how often and how long patients continue ailing and complaining of feebleness and want of power without presenting any very tangible symptoms, when an examination of the urine reveals the cause of the anæmia, the weakness, and the apnœa, and at once suggests the proper indication. Although albuminuria is a much more frequent cause of these insidious symptoms than azoturia, still I am satisfied that there are numerous cases of chronic disease going through a weary life, for which the undue waste of the nitrogenous tissues indicated by a high specific gravity of the urine and an excessive proportion of its urea affords a satisfactory explanation.—*British Med. Journal*, *June* 3, 1865, *p.* 557.

DISEASES OF THE URINARY ORGANS.

32.—ON THE PATHOLOGY OF DIABETES.

By Dr. George Harley, F.R.S., Professor in University College, and of University College Hospital.

[It is well known that cerebral lesions, especially when in the neighbourhood of the fourth ventricle are not unfrequently accompanied with saccharine urine. Epilepsy is also occasionally accompanied by diabetes.]

Over-mental exertion is among the causes of saccharine urine. An interesting example of this kind has recently fallen under my notice in the case of one of our students. During three weeks of mental excitement, sugar was daily detected in his urine. After a fortnight's rest, it entirely disappeared, but recurred a few days after the resumption of the mental labour, again to disappear almost as soon as the labour was discontinued. I have seen again and again mental labour increase the sugar in diabetic patients. In the case of a clergyman, to which I shall subsequently have occasion to refer, on several occasions I found the daily amount of sugar double itself when he was preparing for his College examinations, and again gradually return to the usual average almost as soon as they were passed, without either medicine or diet being altered.

Irritation of the pneumogastric or of the sympathetic nerves may give rise to diabetes.

Mr. Nyman relates the case of a professional gentleman who had long suffered from diabetes mellitus. "After we had examined," he says "the above-named organs (chest, abdomen, and brain), we commenced the dissection of the nervi vagi. On the left nothing abnormal could be found, but on examining the right, we met in the thorax immediately behind the bifurcation of the bronchii a calculous mass (tumour) the size of a hazel-nut, under the entire trunk of the nerve, which appeared to have exercised considerable pressure upon it." He adds that it is the third time that he has met with this morbid condition in persons who have died from diabetes. The urine of this patient contained 6 or 7 per cent. of sugar.

One case is also recorded in which disease of the sympathetic caused diabetes. In a report of the cases occurring in the Royal Infirmary, Edinburgh, under the care of Dr. Duncan, it is noticed that in one case of diabetes there was found, after death, to be an hypertrophy of the lumbar sympathetic.

Saccharine urine may also arise as the result of indirect nerve irritation; thus it is met with in tumours of the abdominal organs and in pregnancy, in which cases the only way to account for it appears to be by the irritation caused by pressure or otherwise to the abdominal sympathetic, perhaps the cœliac plexus or some of its branches.

For further information regarding the effects of nerve lesions and irritation in the production of diabetes, reference must be made to the physiological views previously expressed.

We now come to the consideration of disorders of the digestive function as a cause of diabetes. And, first of all, we must notice those cases which arise apparently from the use of stimulants. It is a well-known fact that cases of diabetes are much more common in Great Britain than on the continent, and I, like many others, attribute this to the fact of a much greater quantity of alcoholic drinks being used among us than among European nations. A few years ago (August, 1861), while on a visit to Munich, in the course of conversation, Dr. Pfeüfer, the Professor of Clinical Medicine, told me that he had only had one case of diabetes in the Hospital during the whole six years he had been in Munich; whereas, while Professor in Heidelberg, although the Hospital was much smaller, he had on an average four or five diabetic cases in the course of each year. Now, the only way to account for this difference was that the Munich Hospital draws its supply from a beer (Bavarian) drinking district, while the Heidelberg Hospital obtains its supply from the wine-drinking districts of the Rhine, &c. And, curious enough, it turned out that even the single cases of diabetes Pfeüfer had in Munich, he added, came from the Palatinate.

There can be no difficulty in explaining this action of stimulants, for, as said in the physiological part of the lecture, diabetes can be artificially induced in healthy animals by injecting small quantities of alcohol, ether, chloroform, or even ammonia, into the portal circulation.

For example, I injected 10 cubic centimetres of sulphuric ether diluted with 30 cubic centimetres of water into one of the branches of the portal vein of a full grown Newfoundland dog half an hour after he had been fed. When he rose up after the operation, he appeared intoxicated, and staggered a little as he moved about. This effect, however, soon disappeared, and in a few hours the animal looked as if nothing had been done to him. In two hours after the injection was made, I passed a catheter into his bladder; but did not obtain sufficient urine to enable me to satisfy myself whether it contained sugar. Some hours afterwards, when I had obtained enough urine, I found that it readily reduced the copper in Barreswil's liquid, thus indicating the presence of saccharine matter. To assure myself that this effect was not due to the presence of any other substance, I boiled the urine in order to coagulate the albumen, of which it contained a little, then evaporated it almost to dryness, dissolved the residue in boiling alcohol, and filtered. The filtered liquid was next evaporated to drive off the alcohol, and an aqueous solution made. On testing the latter for sugar with the sulphate of copper solution, its presence was clearly indicated. Although by this method the existence of saccharine matter was rendered almost undeniable, I still wished to convince myself of its presence by some other means. The urine which the dog passed the next day was therefore fermented, and carbonic acid gas and a trace of alcohol was obtained, thus placing beyond a doubt the existence of sugar.

The following case shows how ammonia has the same power as ether in causing the liver to secrete an abnormal amount of saccharine matter :—

Into the portal vein of a good sized dog in full digestion, I injected fifteen drops of liquor ammoniæ diluted with forty cubic centimetres of water. In twenty hours afterwards, on the animal being killed, his bladder was found enormously distended with urine, which not only reduced the copper in the liquid of Barreswil, but fermented rapidly.

These two experiments are selected from a number of others, some of which I had the honour of performing in 1853 at the College of France before a commission appointed by the Société de Biologie; but as the results then obtained are identical it is unnecessary to cite them. I cannot refrain from mentioning with what pleasure I perused a communication of Bernard's,

entitled "On the Influence of Alcohol and Ether on the Secretions of the Digestive Canal, of the Pancreas, and of the Liver," read before the Société de Biologie. M. Bernard, instead of putting the alcohol and ether, as I had done, directly into the portal vein, introduced them by means of a long œsophagus tube, into the duodenum of dogs, and allowed them to be absorbed through the walls of the intestine, into the portal circulation. The result as might *à priori* have been anticipated, was identical with what I had previously obtained. Bernard, in fact, found that six centimetres of alcohol mixed with an equal amount of water, was sufficient to excite the liver to secrete a large quantity of sugar, even while the animal was fasting. With ether employed in a similar manner, he obtained no less successful results.

Rosenstein has still further confirmed the value of the physiological data I obtained, by a very complete series of experiments on the influence of different kinds of drink upon the quantity of sugar, salt, and urea, daily eliminated by a diabetic patient. He performed the experiments, he says, with the view of ascertaining if the conclusions I arrived at were equally applicable to the human subject as to the animals operated upon, and he came to the conclusion that they are identical from his having obtained the following results:—1. Coffee, while it diminished the elimination of urea, increased that of the chloride of sodium and sugar. 2. Bavarian beer had a precisely similar effect. 3. The influence of wine was also similar —namely to decrease the elimination of urea, and augment that of the chloride of sodium and sugar. Lastly, he found that vinegar exerted a similar influence on the elimination of these substances.

If any one doubt the truth of the assertion that stimulants excite diabetes, let him select a case of that form of the disease arising from excessive formation, and after having carefully estimated the daily amount of sugar eliminated by the patient, allow him to drink a few glasses of wine during the next few days, and watch the result. He will soon find that the ingestion of stimulants is followed by an increase of sugar, and if stimulants increase the amount of saccharine matter in the urine of the diabetic, we can easily understand how their excessive use may induce the disease in individuals *predisposed* to it. The effect of stimulants introduced into the portal circulation also explains to us how a disordered digestion is not unfrequently followed by saccharine urine. I may here relate a curious fact in illustration of the latter remark. In 1852, at a time when I was much occupied in studying the physiology of diabetes, I regularly tested my urine twice a-day, and on one occasion I found it to contain a small quantity of sugar.

On the day in question I had partaken freely of asparagus salad; and, thinking that this might perhaps be the cause of the presence of the sugar, I determined to try the effects of a greater quantity. The following day, the sugar having entirely disappeared from the urine, I again partook of the same kind of salad, both in the morning and afternoon. In the evening, on testing the urine, I found very distinct indications of sugar. As the observation was to me one of great interest, I determined to make some further experiments on the subject, in order to discover how many hours this state of saccharine urine would continue. During two days I ate large quantities of asparagus salad, taking care to have it made as stimulating as possible with vinegar and pepper. The result was far beyond my expectations, for instead of the sugar disappearing from the urine in a few hours after I had ceased partaking of the diet in question, it continued to be secreted during several days, until I at last became very much alarmed lest the disease had been permanently induced. On the evening of the fourth day the sugar had almost entirely disappeared, but on the fifth it returned in increased quantity, so much so that a drop of urine falling on the boot left a distinct white spot. I could not account for the recurrence of the disease, as I had been particularly careful in my diet during the two previous days.

I have mentioned this experiment because it appears to me that if a flow of saccharine urine be induced in a healthy person, as I consider myself to be, by disordering the digestion and over-exciting the liver, it is very probable that a cause insignificant in itself, but operating upon a predisposed constitution, may tend to produce the disease. Sugar in the urine has been found after eating cheese and other indigestible substances. It is worthy of remark that Dr. Jessen, of Dorpat, has rendered horses diabetic by feeding them with hay damaged by moisture. M. Léconte has also found sugar in the urine of dogs after he had administered to them the nitrate of uranium. Several other substances have the same effect, and I have no doubt but that a greater number of stimulants will be afterwards found to produce similar results.—*Medical Times and Gazette, Oct.* 21, 1865, *p.* 437.

SURGERY.

DISEASES OF THE BONES AND JOINTS, ETC.

33.—ON CERTAIN ERRORS IN THE TREATMENT OF JOINT-DISEASE.

By R. Barwell, Esq., Assistant Surgeon, and Lecturer on Comparative Anatomy, Charing-cross Hospital.

[The disease to which the author refers in this paper is strumous synovitis, and the error he impugns is taught in most hospitals, and is based upon high authority.]

I must be allowed to give some description of the morbid processes, which constitute, and the morbid growths, which are constituted by a strumous synovitis. When an inflammation, be it simple, traumatic, rheumatic, or strumous, attacks a synovial membrane, there is set up, besides the mere increase of vascularity with redness, pain, &c., &c.—there is set up, I say, a brisk action in the tissue itself, both on its inner surface and surrounding parts. This action is a very rapid growth of cells. All areolar, fibrous, basement, membranes, in fact, all connective tissues, are composed of cells, somewhat elongated, stellated, or otherwise changed in form; but still possessing their nuclei and procreative power. Inflammation of such tissues essentially consists in the rapid production by these cells and nuclei of a numerous progeny, which lies heaped up in the meshes of the parent structure, or, at least, in as much of it as has not melted away in their production.

Now, it is on the ultimate fate of this progeny that the issue of the attack, that which in surgical lectures we were taught to call the "termination of inflammation," depends. If these cells evolve themselves healthily into new tissue, the inflammation terminates by resolution, leaving thickened structures behind. If the cells become pus-cells, the attack terminates by suppuration, and so on. This process of cell formation is exactly the same action as that which is produced to fill up an open wound, and which is called in such circumstances granulation. Now, whether they be situated externally as in an open wound, or internally as under the yet unbroken skin, such granulations have, under certain conditions of constitution, a great tendency to become indolent and sluggish—*i.e.*, the cells incline simply

to reproduction and not to metamorphosis into tissue. We see many open sores, from which project large, soft, almost gelatinous granulations, which do not grow firmer, scarcely unite among each other, and make no progress towards forming a new tissue. At some period or periods of the disease a portion or all of this mass becomes pale, almost green in hue, its discharge thinner, and presently that district of jelly-like tissue disappears very rapidly, in part by suppuration, in part by a kind of slough or degeneration. This cause may be sufficient to make the wound, instead of projecting, hollow; but it will soon refill itself, and these changes may succeed each other again and again without any increase of tissue or advance towards healing; on the contrary, the granulating process has a tendency to invade more and more sound tissue of the neighbourhood.

The natural course with an inflamed joint, as with a wound, is, that the granulations should form new fibrous tissue, and the part recover with a certain amount of thickening according to the severity and duration of the disease; but it frequently happens, and especially in strumous constitutions, that the granulations fall into the sluggish state described. Parts of them even will suppurate, degenerate, and disappear, so that abscesses, cavities, &c., are produced in the thickness of the mass itself, and these conditions may continue indefinitely without tendency to heal; on the contrary, more and more fresh tissue is constantly becoming involved. The white swelling, a name which has been translated into every European language, is a term properly confined to this sluggish disease. The *tumeur fongueuse* of certain French writers denotes the same malady. This is the disease which Sir B. Brodie termed "a morbid change of structure of the synovial membrane, and which he considered analogous to tubercle and fungus hæmatodes" ("Diseases of Joints," p. 85). When we have an opportunity of examining pathologically the condition left by this disease, we find it the following:—The tissues, forming and surrounding the joint, including bones and cartilages, are infiltrated with, or become converted into a soft, yellowish, or pinkish brown material, of a translucent nature, through which long sinuous vessels meander. The cavity of the joint, filled with pus, is much encroached upon by this material, which creeps from the side over the cartilages, and adheres to them in spots, where they are themselves converted into a similar structure. In fact, the joint has now become an abscess, surrounded by a thick, new structure—a transition tissue, which, examined either macroscopically or microscopically, is found to be nothing else than granulation tissue, formed of round, fusiform, and fibrous cells—the offspring of the articular and peri-articular tissues.

The course of the joint-disease for months, perhaps years, ay, indeed, the ultimate fate of the joint itself, depends upon the evolvement of this tissue, either towards completion or towards decay, exactly as the different conditions of an ulcer depend upon the development into new tissue or upon the degeneration of its cells.

The phases of a strumous synovitis are these :—

1st. Inflammation and active granulation.

2nd. Indolence, with languid cell-growth.

3rd. Development or degeneration of the granulations into fibrous tissue or into pus and sloughs respectively.

The degeneration, *i.e.*, the suppuration and death of the jelly-like granulation involve generally only portions of the substance, and form localised abscesses in the thickness of the mass, or an enlarged area of joint-cavity filled with pus. This central cavity opens after a time externally, the localised abscesses form communication with that area and with the outward air.

The external aspect and condition of the joint itself differ essentially in each of the above phases. In the first, the inflammatory, it is swollen, hot, tender, often reddened ; the patient is in a state of pyrexia. In the second, the joint is more swollen, and its form, if superficial, is rounded, shapeless, dumpling-like ; it is cool, and *not* tender, or but very slightly so ; the patient's health is depressed, and the condition is not feverish. This phase is *par excellence* that of *white swelling*. Of the third stage we will speak in the sequel.

Now, the common and authorized mismanagement, which I deprecate, takes place in the second, the torpid phase of the disease. Infirmary, hospital, or private patients are, as a rule, ordered to remain in bed or at complete rest, with the limb on a splint, for months, even for years. We find these patients pale, exsanguine, etiolated, having a large, shapeless joint, cool, white, uninflamed, perhaps, with a great issue in it and a poultice over it. Thus, inactivity is added to sluggishness, enforced indolence to the passivity of disease, and with such treatment it is not to be wondered at that but few such joints recover ; that Sir B. Brodie, whose one *panacea* for articular disease was rest, continuous rest, should have ascribed an almost malignant character to this malady, and should have been led to say, "In every case, in which I have it had in my power to watch its progress, the complaint has advanced slowly and sometimes has remained in an indolent state during a very long period, but ultimately it has always terminated in the destruction of the joint."

Deeply impressed with the want of success of the practice as above described, I have been led to adopt an opposite course of treatment in the second, the sluggish phase of the disease ; and

with such success as to encourage me to continue the same method and to bring it prominently before the profession. As soon as the inflammatory stage has passed, I prescribe movement—at first passive, then active,—friction, pressure, and a series of exercises destined to restore form and flexibility. I will not now enter into minutiæ of such methods, since the one or two appended cases, copied from the many in my note-book, will suffice to show how and when one or the other should be used. But there remain essential points for consideration :—Firstly. What are the signs that we may safely remove a diseased joint from the splints, cease all remedies against inflammation, and adopt the treatment above described? Secondly, and this is very important. What are the signs that degenerative actions have already set in and advanced so far that such measures would be not merely useless but hurtful?

I will endeavour to answer these as plainly as I possibly can, but I must observe that the response to the former question is far easier than to the latter.

The signs that inflammation has so far ceased as to warrant the use of movement, &c., are coolness and whiteness of the joint, and, above all, a cessation of tenderness—not merely of a general more or less superficial tenderness, (which often subsists in a splinted joint long after inflammation has ceased,) but of the tenderness in the special locality appertaining to each joint. The fact of a special locality for pain is very peculiar, and requires an explanation. It is well known that, in every acute inflammation of joints, the pain of the disease is referred especially to one part of the organ; even although the whole limb may be painful, there is always one special point of which the patient more particularly complains. This fact, taken in itself, is singular, but practically unimportant, save that it throws a curious light upon the circumstance to which I would call attention, namely, that in chronic joint-diseases, in which pain during rest no longer exists, there yet remains a certain point for each articulation which continues tender as long as any inflammation persists. This point is in all cases that same place which in acute diseases is especially painful.

These are—for the knee, a small space over the inner trochanter and inside the patella; for the elbow, the posterior part of the junction between the radius and humerus; for the wrist, the union between the scaphoid and ulna; for the ankle, a spot just outside the extensor longus tendon. For the shoulder, this choice spot of tenderness is situated at the back and external aspect, where the posterior fibres of the deltoid cross the joint; at the hip, the test place is just behind the trochanter. It may appear to many a dangerous doctrine to assert, that tenderness being absent in this choice seat of pain, inflamma-

tory action in the joint itself has ceased. No surgeon would ever, I presume, examine a joint without feeling it all over; but the especial attention, the indication for treatment, is to be taken from the condition of this point.

Let us, then, suppose a case to come before us. A patient has been for some months affected with strumous synovitis; the knee is round, soft, having a pasty feeling, and is white and cool; there is a little dull sense of pain on pressure with the tip of the finger all over the joint; but rub it with the palm of the hand slowly and with some pressure, and this slight tenderness, which is merely the effect of the skin having been kept from the air by bandages or poultices, will soon cease. Press now with some firmness over indifferent parts of the joint—*i.e.*, everywhere but on the point to be interrogated; see that all this superficial sensitiveness has disappeared, or that, at all events, you can appreciate its amount; then, and not till then, make with the thumb pressure, at first gentle but gradually increasing, until it becomes pretty considerable. If no expression of pain be elicited, you may feel sure that joint inflammation has ceased.

Now, to continue rest, antiphlogistic treatment, poultices, or the like, is the mismanagement I have so frequently mentioned. Such treatment directly aids in the slow, sluggish destruction of the limb, which, under such circumstances, is so certain, that a man with all the experience of Sir B. Brodie considered it inevitable. At the present day even, I have no hesitation in saying that nearly all surgeons would still order such a joint to be kept at rest, to be blistered, to have issues in it, and poultices applied, although innumerable examples show how worse than futile is such a course. It is because I hold this conviction that I have ventured to bring forward in so detailed a manner a subject which is not perfectly new. I pointed out in 1860, in my work "On Joint Diseases," the false practice of this continual rest, and I have since published lectures on the subject; I also detailed the choice seat of tenderness for each joint. Since then my experience has impressed upon me even more fully the value of the practice, which I then inculcated, and how essential to a joint in this condition is the stimulus of movement of pressure, &c., to cause the granulation cells to contract and form themshlves into new tissue instead of remaining sluggish, until they degenerate into fatty cells and sloughs.

There is yet another question to be answered—viz., after degeneration has once set in, when there are abscesses in the thick tissues surrounding the joint which open and discharge externally, when there is reason to suppose that the cartilages have disappeared totally or in part, are we to keep the limb still at rest in the hope of producing anchylosis, or are we to

inculcate movement, &c. ? My answer most decidedly is, that in cases where the health is not very much broken, where destruction has not invaded all the tissues, where the central abscess is not larger than the thickened tissues themselves, and where there is no grating, carefully-arranged pressure followed by passive movement, will do more to consolidate the tissues and cause the abscesses to heal than can be imagined by those who have not tried the method.

One point, however, must be noticed—viz., the fact that when a limb has been kept at rest for some time, whether for fracture, joint-disease, or other cause, movement will always produce pain ; and this is so often believed to be pain in the joint from continuance of the inflammatory action, that the salutary remedy is checked. The surgeon must carefully distinguish the one from the other—a diagnosis in which he will have but little difficulty, if he carefully compare the position of limb in which the pain chiefly occurs and the action of the muscles.—*Medical Mirror, June* 1865, *p.* 334.

34.—ON AMPUTATION BY SINGLE FLAP.

By Henry D. Carden, Esq., Consulting Surgeon to the Worcester General Infirmary.

In 1845, my attention was drawn to a few of my old cases of amputation; and I was much struck by the fact that, where double muscular flaps had been employed to cover the end of bone, the cicatrix had been drawn gradually over the sawn part, rendering the stump incapable of bearing the least pressure; whereas, in the two cases referred to, the flaps were plump and painless, and capable of bearing very considerable pressure on the end without flinching.

Under these circumstances, I determined to try the method of amputation by a single flap of skin; and I have been so well satisfied with the results, that I have never since that time used any other.

The operation consists in reflecting a rounded or semi-oval flap of skin and fat from the front of the joint; dividing everything else straight down to the bone; and sawing the bone slightly above the plane of the muscles; thus forming a flat-faced stump with a bonnet of integument to fall over it.

The operation is simple; and is performed easily in two ways.

The operator, standing on the right side of the limb, seizes it between his left forefinger and thumb at the spots selected for the base of the flap, and enters the point of the knife close to his finger, bringing it round through skin and fat below the patella to the spot pressed by his thumb; then, turning the

edge downwards at a right angle with the line of the limb, he passes it through to the spot where it first entered, cutting outwards through everything behind the bone. The flap is then reflected, and the remainder of the soft parts divided straight down to the bone; the muscles are then slightly cleared upwards, and the saw is applied.

Or, the limb being held as before, the hand and knife may be brought round under the limb, as in the circular operation, and the blade entered near the thumb and drawn round to the opposite side, when the ham may be cut across by turning the edge of the knife upwards, and the operation completed as before. This requires rather more dexterity and flexibility of wrist than the first method.

Or the flap may be reflected first, and the knee examined, particularly if the operator be undetermined between resection and amputation. In amputating through the condyles, the patella is drawn down by flexing the knee to a right angle before dividing the soft parts in front of the bone; or if that be inconvenient the patella may be reflected downwards.

In this operation, the arteries are easily found and secured, without loosening their tourniquet; but there is a point worth noticing whilst tying the popliteal artery in this situation; namely, its close proximity to the vein, and the tendency to secondary hemorrhage from the vein in consequence. This occurred to such an extent in two of the early cases, that I had to re-open the dressings, and found the closure of the vein prevented by the stroke of the artery. This was immediately checked, and afterwards always prevented, by gently separating the vessels for an inch upwards. The flap falls easily over the end of the bone; and, when united to the posterior integuments by a few pins or sutures, is drawn strongly upwards and backwards by the greatly retracted flexors, and has a somewhat puckered and redundant appearance at first. This is no disadvantage.

The dressing may be of the lightest and simplest kind; a few strips of soap-plaster between the sutures, and a light bandage perhaps. I have often been content to use a cap of soft porous linen, drawn over the end of the stump, and secured above by a broad circular strip of plaster. Whatever dressing be used, it is of great importance to loosen it and examine the stump early, and to carefully provide for the free escape of serum. I remove the pins or sutures at from twenty-four to forty hours at furthest, and never find that I have opened the dressings too soon.

The principal advantages obtained by this plan appear to me to be the following:—the facility afforded for amputating, either through the knee or through any part of the lower end of the femur; thus proportionately avoiding the shock of higher

amputation, and the risks of exfoliation, pyæmia, &c., attendant on sawing through the cylinder of the bone; the simplicity of the whole proceeding, and small extent of the wound; the favourable position of the flap for dressing and for the escape of discharge; painlessness and quietude of the stump, the principal nerves being divided high up and drawn out of reach of pressure or exposure; the fitness of the stump to stand and walk upon; the bearing being broad, and the skin employed being accustomed to bear the weight of the body in kneeling; the cicatrix being drawn clear of the point of the bone, out of the reach of pressure.

Having been frequently urged, by friends who had witnessed the result of my method, to publish the foregoing cases, I had prepared the table in 1858, accompanied by the sketches and photographs, with that intention, when Mr. Teale's valuable work on *Amputation* appeared, and seemed to me, at first sight, to render anything further on the subject unnecessary on my part. Mr. Teale's method of operating with a long and a short rectangular flap appears to provide an excellent stump to walk upon, when the materials for forming it are attainable. The evidence of Messrs. Grossmith and Heather Bigg is conclusive as to the great superiority of Mr. Teale's operation in this respect over the double flap and circular plans. His rate of mortality, also, is greatly in favour of his plan, compared with the usual methods. It appears to me, however, that an eight-inch muscular flap is not always to be had, with due regard to the essential principle of removing the point of severance as far as possible from the trunk. (Erichsen's *Science and Art of Surgery*, second edition, page 20, lines 33, 34). The extent of wound is certainly great, being thirty-two inches in a circumferance of sixteen; whilst the divisions of muscles longitudinally for eight inches can scarcely be accomplished at all times without risk of bad consequences, particularly by surgeons less skilful than Mr. Teale.

Mr. Lister's observations on Teale's method, in his essay on Amputation in the third volume of Holmes's *System of Surgery*, lately published, bear so directly on the subject of this paper, that I may be allowed to quote his opinion. He says, page 162: "Thus, in a particular instance, where the development was by no means extraordinary, the dimensions were such that, supposing the anterior transverse incision made at the level of the upper border of the patella, it would have been necessary, in order to preserve Mr. Teale's proportions, to saw the bone eleven inches further up, or full five inches higher than if the modified circular operation were performed. This must, *cæteris paribus*, very seriously increase the risk, which is always greater the nearer the seat of amputation is to the trunk. The cut

surface is also very extensive; and this would give rise to a correspondingly large amount of suppuration, if immediate union failed. It therefore becomes an important question, whether the advantages of Mr. Teale's plan may not be obtained in some less objectionable manner."

He then proceeds to propose a modification by an anterior flap of six inches in front, without any posterior flap at all, retracting the muscles two inches before dividing the bone; and observes: "That such a procedure would answer well is not, however, a mere matter of inference; for, since the appearance of Mr. Teale's work, Mr. Spence of Edinburgh has performed some amputations of the thigh according to his directions, and others by cutting from without inwards a large rounded anterior flap, dividing the posterior parts at the level of its base by a perpendicular sweep of the knife, and retracting the muscles before applying the saw. I have had the opportunity of comparing the fulness of the cushion in both cases; and Mr. Spence tells me that, where it has been formed after the latter mode, it has proved capable of bearing a large proportion of the weight of the body.

"Still, this proceeding would involve as high a division of the bone as Mr. Teale's, if the anterior flap had the length above mentioned: and the question yet remains, whether it may not be curtailed, and eked out with a short posterior flap, without impairing the usefulness of the stump. Provided the covering of the bone be sufficiently full, the essential thing to be attained is, that the tender cicatrix shall be so placed as to be free from any chance of being squeezed between the bone and the bottom of the socket of the limb. Now, it fortunately happens . . . that the bone lies forward among the muscles, so that even its posterior surface is considerably anterior in position to the longitudinal axis of the limb. Hence a flap half the diameter of the limb would more than cover the bone; and one as long as two-thirds of that diameter would ensure the scar being considerably behind the point of pressure; especially as the absence of the two inches of bone above the base of the flap would allow it to drop lower than it otherwise would. Also, in the further progress of the case, the contraction of the muscles will draw the cicatrix still further back; an effect long since noticed by Alanson after his circular operation."

Mr. Lister then proposes that, "in order to compensate for the diminution of the anterior flap, a posterior one must be made of rather more than half its length, and of rounded shape, for adaptation to it; and the integument of this flap should be dissected up before the posterior muscles are divided, so as to set it free from the effects of their contraction. On the other hand, the anterior flap, after being marked out by carrying the

knife through the skin and fat, should be raised so as to contain a good deal of muscle, which will be useful, both by insuring the vitality of the rather long flap, and also by increasing the thickness of the cushion below the bone; while any tendency to contraction that it possesses (small compared with that of the posterior muscles) will be counteracted by the force of gravity, through which it will naturally tend to occupy its proper place."

"By this mode of amputating, the bone will be divided about as low as in the modified circular operation; and, though I have not yet had much opportunity of trying it on the living subject, I feel satisfied from the above considerations, and from experiments on the dead body, that it will attain the essential objects of Mr. Teale's plan, while it will occupy less time than either of the methods alluded to. The flaps, when brought together, will be free from tension; and the stump, if properly dressed, most favourably circumstanced for safe and speedy healing."

In his observations on dressing, Mr. Lister lays great stress on providing a free escape for serum. This, I can say from experience, is a most important point, and one that cannot be too strongly urged.

It will be obvious from the above extract, that Mr. Lister still considers that no plan hitherto adopted has fulfilled the requisite conditions in amputations of the thigh; namely, that of obtaining a long and useful stump in this situation by a sufficiently safe and simple operation.—*Mr. Carden's Pamphlet on Amputation.*

35.—ON AMPUTATION.

By Wm. Fergusson, Esq., F.R.S., Surgeon to King's College Hospital, Professor of Surgery in the Royal College of Surgeons, and Surgeon Extraordinary to H.M. the Queen.

[There is a rising feeling to preserve a long anterior and short posterior flap, in order to keep the cicatrix at the back of the stump and to facilitate the escape of matter, whilst the patient lies on his back.]

A compromise, I imagine, goes far to settle what may be deemed the best method of amputation in such important places as the arm and thigh. A little of the flap and a little of the circular constitute, I believe, the most perfect operation; and in my own practice I have long followed out that idea.

Of the two operations, I have always thought that the circular is the most difficult. The comparative difficulty of drawing up the skin and other tissues, so as to make bare the bone at a sufficient height, is considerable, and a great contrast to the

easy way in which this is accomplished by flaps. The facility of exposing the bone high up is comparatively so great with flaps that I am impressed with the idea that more is often done in this way than is actually required ; and, if I am correct in this, I believe that a larger wound is the result than if the bone were not so freely exposed. If in the transfixion of the limb—that being the usual way of forming the flap—the knife crosses almost as high as where the bone is to be divided, there is a greater wound made than if the transfixion were kept considerably lower : the skin on opposite sides, being cut, is wounded where it might be left entire ; for after flaps of moderate extent are cut, they, with the tissues above, may be so pulled upwards that, with some circular sweeps of the knife the bone may be denuded an inch or two higher, and so there will be a smaller opening in the skin.

Now this is that kind of compromise to which I have referred in the preceding remarks ; and if, in transfixing, the flaps be made purposely short, and then, retraction being made, the knife be carried round the exposed tissues which cover the bone, a cone will be formed resembling that in the ordinary circular operation, and thus by a combination—a compromise of the two methods—a covering to the end of the bone, in other words a stump, will be left superior, in my estimation, to any other.

Yet this is only an individual opinion, and there are many who hold to the ordinary method by flap, many who still hold by the old circular, and some in recent days who carry the flap system beyond what was ever contemplated by its early advocates. Thus Mr. Carden and the Worcester surgeons take especial care to exclude other soft tissues, so that skin only shall cover the bone or bones.

Irrespective of either circular, flap, ovoid, or any other sort that may have been fancifully named, I think it must be admitted that amputation by almost any fashion has made progress during the present century. I take this opportunity, however, of entering my protest against that of burning or wringing a limb off by any kind of apparatus whatever. Cheselden gave us the case of the miller who had his arm and scapula torn off by machinery, and yet survived. Several instances of a similar kind have since been met with. We have good data as to how the bleeding is arrested in these cases. Hands and arms, feet and legs, have been torn off by accidental rude force. A chain has been put round a rabbit's leg and drawn so tight that the part has dropped off within a few minutes, and the like has been done on a human thigh ; but I sincerely hope that these processes may never appear as part of the surgery of this or any other century. Let Cheselden and others have due credit for treating successfully enormous and

unheard-of wounds, but let a due distinction be drawn between that which is possible and that which is proper.

With the exceptions alluded to, I conceive that there has been much beneficial progress in amputation in recent times, and it is part of my object in this lecture to give illustrations to that effect.

As may have already been remarked, I do not attach so much importance to the question of flap or circular as many do; and whilst giving the preference, as a general practice, to the mixed manner above referred to, I believe that with a well-performed operation in any of these ways, or with any zig-zag which circumstances or the surgeon's fancy may dictate, a stump can be be produced which shall defy adverse criticism; while by any of these methods, badly executed, any or all of the evils pertaining to bad stumps may be the result.

In my younger days, the grand effort of all operators, whatever the kind of operation, was to have an abundance, or I might say a superabundance of soft material to cover the end of the bone, and make what was called a fleshy stump. The bugbear in those days seemed to be the risk of scantiness in this respect, and hence every substance was looked to which might afford the needful amount of soft materials. Every now and then it was evident that mistakes were made in this direction: a greater length of soft parts was left than was needful; and occasionally, when the length seemed perfect, the flap was actually too thick to bend readily and properly up against the end of the bone or bones. This was often seen particularly marked in the flap operation in the leg, a little below the knee—a proceeding at that period mostly in fashion. If the operation were done for an accident—for example, on an athletic navvy,—a flap being formed by transfixion from the muscular calf often proved a troublesome one to treat. The skin by this method of operation, although in reality cut lower down than the muscles, retracted more; and although that retraction was seemingly overcome in the dressing, as stitches were applied, the subsequent swelling of the muscles often burst the superficial union, and, shooting between the margins of skin, presented for weeks or months a large granulating sore, which healed but slowly, much to the distress of the patient and vexation of the surgeon. I remember well that Mr. Liston was so much annoyed in this way that he latterly made the posterior flap in such an operation much thinner than on former occasions; and I can speak freely of my own experience in the same operation. It is long indeed since I came to the conclusion that it was unwise to leave a thick muscular flap. Part of the fault in such cases arose, I believe, in the almost uniform practice of transfixing and cutting outwards. I am by no means convinced

that this is invariably the best method of performing the flap operation, and I feel assured that cutting from without inwards is in many instances followed by the best results. But I may say that I have seen the two extremes with regard to the substance of flaps, for in latter years some of our ablest surgeons have advocated the practice of carefully excluding all material but skin, cellular tissue, and fat. We are greatly indebted to the surgeons of the Worcester Infirmary, Messrs. Carden, Sheppard, Budd, and Walsh, for our knowledge of upwards of sixty such cases, wherein the practice has given much satisfaction.

Some of these recent views I attribute largely to the proposals of Mr. Teale, of Leeds, who, in this as in other respects, has contributed so much to the established reputation of that school of British surgery. In a series of examples he has endeavoured to show the advantages of long flaps from one side of a limb, wherewith to cover the ends of bones, and short flaps in which the main vessels and nerves are preserved.

I should be untrue to the position I hold were I to decry amputation either at the shoulder or the hip-joints. On the contrary, I consider them as amongst the best achievements in surgery when judiciously applied. But I believe that there is still much to be impressed on the surgical mind in regard to amputation at other joints; and with a few examples of the kind I shall close this lecture.

Happily for the character of surgery, amputation in the arm for disease of the elbow may now be considered obsolete. I feel inclined to say as much for injuries of the elbow strictly local. There may be an exception every now and then to that general rule, as I hope it may now be considered. If such there be, why should the surgeon almost invariably get into the middle of the arm for his incisions? Why should he not take the covering of the end of the humerus from the forearm? If he wants skin only, there will most likely be plenty of it; if muscle, he has the whole fleshy mass at the head and front of the forearm to deal with. I feel convinced that amputation near the middle of the arm has often been done when this more conservative process might have sufficed.

Then at the wrist. How often may I ask, has amputation been done at this joint? I know that it has been done, but I have never seen it, excepting in my own practice. Every now and then good results of resection of the wrist are effected, as has been proved years ago by Mr. Stanley, and more recently by Mr. Butcher and Mr. Lister; but from my personal experience after repeated trials I am far from being sanguine of the general applicability of excision in this locality. Yet I can

speak in unmeasured terms of approval of amputation at this part in preference to amputation higher up in the forearm.

Again, look to the knee as the seat of amputation. Twelve months ago I asked in this theatre, how many surgeons in Britain had performed this operation. I was aware at the time how much had been done by Mr. Syme, Mr. Liston, Mr. Lane, Mr. Erichsen, and a few others, but particularly by Mr. Carden, of Worcester, whose doings, in my opinion, reflect vast credit on modern surgery. In the British Medical Journal for 16th of April, 1864, Mr. Carden published the particulars of thirty-one cases in which he had performed this operation, with an expression of opinion that it was likely to be more successful, and that the stumps were better than in ordinary amputation in the thigh. Of that I have long had no doubt. More than twenty years ago I had satisfied myself on that score; and had it not been that I fancied I had struck a richer vein in surgery by the rivival of excision of the knee, I am certain that most of those cases which I referred to in my lectures on this operation last season would have been brought before you now as illustrations of amputation at the knee. Before I commenced excision I had amputated frequently at this part, and with the most gratifying results. One case I have recorded in my book on Surgery of a man who walked ninety miles in three days on such a stump; and from all I have seen and known of this operation I am greatly astonished that it has been performed so rarely. No doubt excision turned attention in another direction. But it might be asked, Why have those who object to excision, who have adhered to the old slashing system of amputation, not taken to this? I imagine that the ulcers, the sinuses, the abscesses, the disorganized synovial membranes, have all deterred surgeons as much from amputation on such questionable ground as it has deterred them from excision. Yet in excision how worthless have such objections been proved!—and have we not similar experience of amputation at the ankle-joint with disease in that articulation and the soft tissues around?

In this operation, I am not aware that any teacher has, more than myself, so strenuously drawn attention to one peculiar feature wherein it differs so much and so importantly from ordinary amputations in the limbs. In the forearm or arm, the leg or thigh, the coverings to form the stump are invariably shaped from the soft parts in these regions. But in amputation at the knee, the covering to the end of the femur, that which is to form so important a part of the stump is preserved from the leg—a piece of surgery which I consider supremely conservative. Supposing that excision of the knee should yet be abandoned, why should not this operation take the place of the larger mutilation six or nine inches higher up.

When the condyles of the femur are sawn off in this operation, Mr. Syme has stated his opinion that there is greater risk of serious inflammation in the broad cancellated surface of the bone than when it is exposed higher up in the ordinary operation. But whilst admitting some such cases, there is no positive proof from numbers of the correctness of this view, and it is quite contradicted by the successful practice of that gentleman in amputation at the ankle-joint (where a broad surface of tibia is almost always exposed by the saw), as also by the usual good results of excision. Moreover, no such evil seems to have occurred in the numerous examples recorded by Mr. Carden. But in some of these cases the cancelli need not be exposed at all. The condyles and articular cartilage, being healthy, may be left. And here I cannot, as a zealous surgeon, but express my thanks and admiration to Mr. Lane for having displayed what an admirable stump may be made in some instances by reserving the condyles and cartilages untouched, and covering them with a flap of skin merely from the front of the leg. Previously, in as far as I am aware, most operators had reserved a covering for the end of the femur from the calf of the leg, but few had ventured to take the calf away and leave only a flap of skin. This, however, is an important feature in Mr. Carden's practice.

It remains to be seen whether such a thin covering or the fleshy substance of the calf will prove the best stump. It will also be an interesting matter for future observation whether a stump with the entire femur or one with the condyles sawn off will be best. No doubt, if this operation comes much into use, there will be a necessity in the majority of instances to remove the condyles; but if it were proved that a stump with the condyles is better, it would be the duty of the surgeon to preserve them on all proper occasions. I am not prepared to give a decisive opinion on such interesting and important points.

As a strong indication of how this operation is estimated by some of the active spirits of the day, I may refer to the opinions of Mr. Butcher of Dublin, who, in his recent work on "Operative and Conservative Surgery," speaks of it with all that enthusiasm which characterizes the writings of that very able and enterprising surgeon.

Lastly, as one of the greatest improvements in modern surgery, let me refer to amputation at the ankle-joint.

It is now about a quarter of a century since Mr. Syme proposed a method of removing a diseased or damaged foot at the ankle, different in all respects from any previous proceeding. His idea was to preserve the ordinary tissue covering the lower surface of the os calcis, so that it might be brought up against

the end of the tibia, and leave a pad almost equal to the normal substance, whereby a stump might be retained superior to any that could be procured from the leg, or from any of those flaps which had previously been proposed from the sides or surroundings of the ankle-joint. At this date it is hardly needful to show how this operation has taken with the profession. Like many others in surgery, it has its faults; but, take it with evil and good, I know of no amputation—no style or kind of amputation which deserves more high consideration. There is everything associated with it to lead to perfection in our modern estimation of such a proceeding: a long stump, and a perfect covering to the end—a covering more perfect than that of any other stump; for the reason that the very bit of soft material on which we naturally stand is still preserved for the future basis of this support. Stumps in the upper extremity are put to little trial or strain, as compared with those in the lower; for these are always looked to as supporters of the weight of the body. The soft tissue under the os calcis is the only part of the lower extremity which has been designed by Nature for this purpose; and, with a happy idea, Mr. Syme proposed to reserve this tissue.

The general success of this operation has been highly satisfactory. Evils have followed in various instances; and in what operation, I may ask, do they not? As a whole, looking to the small part of the body necessarily removed, the great length of limb preserved, and the natural character of the end of the stump, I most cordially express my opinion that this is the greatest addition to amputation in modern times.

In saying this I do not overlook the proposal of Pirogoff to retain the end of the os calcis. I consider the operation of the Russian surgeon a decided improvement on that of Mr. Syme. Yet it is, in my opinion, only a modification, which, even should it ultimately be allowed by all to be an improvement, by no means detracts from the merit of Mr. Syme for reserving a flap from the sole of the foot. The idea—one of the happiest in modern amputations—corresponds with that which I have insisted on as an important feature in amputation of the leg, where a flap or covering for the stump of the thigh is preserved from the leg.

It is not so much my object at present to compare one operation with another, as to mark the modern development of surgery; and if I am not mistaken, this operation may, in regard to amputations, be considered as far a head of any other in this department, and I therefore refer to it specially as one which pleasingly characterizes the progress of surgery in the present century.— *Lancet, July* 8, 1865, *p.* 29.

36.—AMPUTATION OF THE THIGH.

By Prof. Fergusson, at King's College, Hospital.

[In the following case there are some interesting and novel points in the mode of operating. There was a large tumour springing from the inner condyle of the right tibia.]

The operation was performed as follows. The patient being chloroformed, an assistant compressed the femoral artery as it passed out under Poupart's ligament, no tourniquet being used. Mr. Fergusson raised the diseased limb nearly at a right angle with the patient's body for about two minutes; he then transfixed the thigh directly in front of and close to the femur, about three inches from the patella, bringing the knife out obliquely downwards. He proceeded in a similar manner at the back of the thigh, making as it were two short flaps. He then divided the tissues close to the bone, while an assistant made retraction. The bone was sawn off about three inches higher than where the knife first passed in; the vessel were then secured, and the flaps brought together with silk ligatures. The wound made but one line, as in the circular operation; and very little blood was lost. Strips of wet lint were then applied to the stump, and a roller over all.

Mr. Fergusson made the following remarks. He said that, after a large experience, he thought it better, in amputation of thigh, to depend on compression of the main artery by the finger of an assistant, than to trust to a tourniquet. It might have been also observed that he raised the limb for a short time, so as to unload the vessels, as it was of importance that as little blood as possible should be lost by the patient in her weak condition. The consequence of this proceeding was satisfactory; not more than an ounce of blood was lost. There were two modes of operation for amputation of the thigh, usually styled the flap and the circular; and he was of opinion for some time that a modification of each could be used, as in the present case, with very great advantage. It may have been observed that he transfixed the limb as in the flap operation, bringing the knife out obliquely downwards; and that he divided the tissues adherent to the bone, as in the circular operation; while retraction was made by an assistant. The consequence was apparent when the flaps were brought together. We had a wound in one straight line, getting rid of the side wounds, which very often extended three inches up the stump in the ordinary flap operation. He thought that this mode of operating would be found to be a great improvement on the old methods.—*British Med. Journal, June* 3, 1865, *p.* 556.

37.—ON FRACTURES.

By Dr. William Lyon, Surgeon to the Glasgow Royal Infirmary.

In the Glasgow Royal Infirmary fractures are very frequently at once put up in pasteboard splints, sometimes in a starch bandage. In this way, I believe, the patient suffers much less pain, and the practitioner a great deal less annoyance. Allowance is made for the occurrence of swelling, but if this happen, to any extent, it is easily relieved by slitting up the bandages. By this method of treatment patients are often able to leave their beds in the course of two or three weeks. While in the simple fractures there is hardly any danger to life, we have found it a very different affair with the compound fractures. Out of four cases of compound fracture that I had lately in the hospital I lost three, and one still remains under treatment. In one amputation was performed, and the patient died of pyæmia. Removal of bone was practised in another, where amputation would not be submitted to, and perhaps this was fortunate, as pyæmia probably existed before the proposition of amputation was made. A third patient, who suffered compound fracture by his limb passing between the spokes of a wheel of a railway engine in rapid motion, and in whom there was much bruising and laceration of the soft parts, was thought, nevertheless, to have a chance of recovery without amputation. He went on very well for a week. Very high inflammation then set in, and this was followed by very copious suppuration. A thorough examination (an examination which could not have been instituted with any propriety at the time of his reception) was now made, and it was believed that his only chance was by amputation. It was performed, but he was seized with traumatic delirium and sank. In fact, so dangerous did we find compound fractures, that a remark was made by one of my colleagues (and I am almost inclined to coincide in it), that if in cases of compound fracture the universal rule was to amputate, a greater number of recoveries would take place. At all events I am deeply impressed with this, that in all cases of compound fracture it is of the very utmost importance to make a thorough examination on admission, to decide whether amputation should be performed or not: for if secondary symptoms are allowed to come on and to progress to a great extent, even though amputation be performed, there is little or no chance of recovery. And therefore, in such cases, I have established the rule with myself to put the patient under chloroform, to ascertain by a careful examination of the parts whether an attempt should be made to save the limb, or amputation at once performed.

We have had cases of compound fracture and dislocation at

the elbow, at the ankle, and very frequently in the fingers. You are all aware of the great danger of a large open articulation. Possibly, you are not quite so much alive to the danger when the open articulation is a small one. All that time will permit me to do is to remind you of the great importance of performing excision in all cases of open articulations, whether large or small, as by this you diminish very much the hazard of the accident. A woman fell from her chair, and dislocated and fractured the end of the humerus, throwing it upon the front of the fore-arm. We performed excision, and in the course of a little while she recovered, with the limb in a condition very little the worse for the accident. In the case, too, of a man whose ankle was excised, he left with a useful foot in a short time. A similar result was obtained in a little girl, in whom the soft parts in front of the ankle were completely divided. At the time of her dismissal from hospital her foot promised to become exceedingly useful. I remember a very striking example of the efficacy of this mode of practice, and the danger of the contrary. A patient was admitted with an injury of the elbow, such as I have described to you, and I performed excision. One of my colleagues had a boy admitted under similar circumstances, about the same time, and he decided to reduce the dislocation and to stitch the wound. My patient, a man of 50, recovered perfectly; the boy was dead in a few days. A man was admitted with compound dislocation of the thumb. It was reduced, but shortly afterwards cellulitis set in, which extended rapidly up to the shoulder, and the patient sank under it. I blamed myself very much indeed for not following up my usual practice, in all such cases, by excising the joint—an operation which I have good reason to extol.—*Glasgow Medical Journal, July* 1865, *p.* 139.

38.—ON OPERATIONS ON THE JAWS.

By William Fergusson, Esq., F.R.S., Surgeon to King's College Hospital, Professor of Surgery in the Royal College of Surgeons, and Surgeon Extraordinary to H.M. the Queen.

[Thirty or forty years ago little or nothing was done in cases of tumour of the jaws, nature being permitted to take her course, and years of misery and a lingering death were the result.]

Of all innovations the operations for removal of tumours of the jaws have created the greatest impression on my mind. There is little active excitement associated with the operation of lithotrity; and ovariotomy, although involving the life of the patient, and demanding both energy and courage on the

part of the surgeon, cannot, as regards performance, be considered a high-class operation. But for the perfect removal of these tumours, I am inclined to think that the highest requirements of operative surgery are called forth. There is such variety of manipulation, such necessity for caution, yet such boldness in action, that in my opinion neither removal of ovarian tumours, nor of the most formidable growths in the scrotum, can at all compare in scientific accuracy with those upon tumours of the jaws.

[The presence of the teeth in the jaw bones, forms an element for mischief such as is absent in all other bones. When tumours are present a question is often raised as to the injurious influence of certain teeth.]

The abstraction of a tooth in such a case is merely fencing with the outside of the disease. In irritation of a socket this doubtless may do good, although at a sacrifice which time might possibly save, but I cannot say that I have ever seen the removal of a tooth produce any substantial benefit in the cases under consideration. The tumour itself must be removed if good is to come from surgical interference. I trust that I am not less acquainted than my neighbours with common-sense surgery, but I never saw a tumour of the jaws dispelled by constitutional treatment. In doubtful cases, and where there has been much derangement of health, I have seen favourable changes, in time and through judicious management. I have even seen a case, where, to all appearance, a tumour was malignant, deep-seated, and beyond all hope of a cure either by nature or surgical interference;—such an opinion was given by one of the best surgeons of the day, and such I confess was my own;—yet in the end it proved to be only a chronic deep seated abscess, which burst, and got well spontaneously. Such mistakes do little credit to surgical diagnosis, and let us hope that they are of rare occurrence.

But I wish now to refer to such cases as are beyond the power of hygiene, and where a process of removal is decided on. Caustics are of little value, ligatures out of the question; in short, whatever enthusiasts may think of their skill in treatment constitutionally or locally, I wish to speak solely of those requiring cutting for their removal—I wish to speak of excision of portions or of the whole of the jaws.

I have selected this theme on the present occasion, partly because it is illustrative of the progress of surgery in the present century, and partly because I imagine that my favourite conservative practice may be as usefully developed here as in any other region of the body or in other cases of surgery.

The first and early operations for removal of tumours in or

of the jaws, initiated by Dupuytren, Gensoul, Hodgson, Wardrop, Lizars, Syme, and others, produced great sensation in the surgical world. In cleverness of conception there seems scarcely a doubt regarding them in the present day; and in vigour of execution they have not yet been surpassed. Yet, even here, it may be doubted if perfection has been achieved; and I venture to make—indeed, I may say, reiterate—my humble contribution towards it, for most that I am now about to say has been stated over and over again in my clinical teaching.

I have no doubt that in diseases of the jaws operations have been performed when they were not warranted; and I am equally of opinion that they have been neglected when they might have proved of the utmost value. Here, as in other departments of surgery, perfection will probably never be achieved. Mistakes and improprieties will occur even in the best regulated minds and hospitals. I make no pretensions to be above them myself; but, by way of originality, I shall plead for a share of conservatism, even here, where it has been comparatively little thought of.

Happily, cancerous tumours of the lower jaw are somewhat rare; but cancerous ulceration, beginning in the gums, or more probably extending to them from the cheek or lips, is by no means uncommon. When the surgeon can encompass the disease in the cheek or gums with the knife, he may clip away the alveolar ridges with good prospect of a satisfactory result, provided the disease be of the kind called in modern days "epithelial." If there be no glandular affection in the neck, the operation is likely to succeed, just as with cancer of the lower lip; but where that kind of cancer has eaten away the lower lip, and laid hold extensively of the bone itself, I deem excision a misapplication of surgery. There is not the smallest chance of a permanently successful issue. I have known this done, and even a flap of skin brought from the neck to fill up the gap; but I doubt the wisdom of the proceeding.

I look upon the lower jaw as giving the most forcible examples of the value of a doctrine which I have long advocated—albeit, contrary to the opinions of many, possibly even against the ordinary doctrines of surgery. In one of my lectures last year I referred to this. Tumours of the lower jaw are often removed by vertical section, and both ends, so to speak, of the bone are left. Everyone knows how successful these operations usually are. When a section is made in the healthy part, it may truly be said that disease seldom if ever returns. Yet this feature is totally lost sight of in the bones in other parts; and so if a tibia or fibula be affected with tumour, nothing but

total ablation will satisfy. Amputation in the thigh is the step. If the femur is affected, the hip-joint only will suffice for the sweep of the amputating knife; and like a pathology prevails in regard to other long bones. But in the lower jaw the surgeon will cut out an inch or two, or two-thirds, of the bone by transverse section, and the pathologist, very properly in my opinion, says not a word against the proceeding. I had great pleasure last year in referring to Mr. Syme's views on this subject, whilst alluding to his novel and bold operations on the scapula and head of the humerus, which he performed with a view to preserve the greater part of the upper extremity; and my own impression is so strong in regard to this that I actually advocate horizontal sections of the lower jaw when it appears practicable. If only as much, in a state of health, can it be retained as shall in some measure preserve the shape of the lower part of the face, so as to prevent the collapse which takes place when the whole mental portion is taken away, I fancy that the surgeon enacts a good example of conservatism.

Again, in operations here, it has been much the custom to make the incisions run into the mouth, thereby involving division of the lower lip. Now, although I do not mean to deny the occasional necessity for this extensive wound, I am strongly of opinion, from my experience, that there is no urgent necessity for division of the prolabium. The mobility of the lips is such that if the mucous membrane of the cheek, which runs to the gums, be divided, the labial orifice may be moved extensively,—so extensively that any reasonable manipulation may be effected on the jaw itself. I know that this limitation has been occasionally resorted to, but it has not been specially referred to as an advantage. I am, however, convinced of this, that even in the removal of the largest tumours there is no necessity for the extensive incision referred to. It may be asked—What does that extensiveness imply? It may be only a quarter of or half an inch! and the question is just such as I desire to answer. Besides saving the lip entire, the principal blood-vessels—the labial artery and vein—are untouched; and so there is neither trouble as regards re-adjustment, nor hemorrhage, as when the lip is cut. If it be needful to cut vertically through the whole thickness of the bone, I fancy that the operation can be done by a lunated incision, just below the lower margin of the bone, with ends reaching upwards, almost as readily as if the mouth were opened at the lips,—the semilunar flap being so easily turned upwards, whilst the division of the mucous membrane will sufficiently relieve the cheek as to let saws and cutting forceps be applied to the bone. If a tumour involves much of the base, division of the facial or external maxillary artery is a necessity. It is from this vessel

alone that severe hemorrhage is to be expected, but by tying it at once, or by judicious temporary pressure, there need be no fear on this point. When a ligature is used, I strongly advise that both ends of the vessel be tied, for in one instance I had great trouble from secondary bleeding from the upper end of the vessel eight or ten days after the operation.

But I am more anxious to refer to operations on the upper jaw than on the lower; for I fancy that I can say fully more that is original in regard to these than those on the lower. I am as strongly conservative here as in other parts of the body; and in this locality I use the term in a double sense, both because I think that parts may be retained which have generally been removed, and because I think that even the features may be more effectually preserved by certain steps than by others.

The modern idea with regard to the removal of tumours in the upper jaw has been associated with excision of the whole of that bone; and the operations of Gensoul, Lizars, Syme, and others, who were the earliest advocates of this proceeding, seemed to imply the absolute necessity of removing the whole of it. The essence of the operation, so to call it, consisted in isolating and cutting through parts of the extreme points or circumference of the bone—even the sacrifice of the malar bone by dividing the zygoma. The round bulging part of the bone behind at the pterygo-maxillary fissure, the orbital plate, its margin or whole extent, the nasal surface, and the palatine plate, were all marked out for removal in excision of the upper jaw. Now, whilst not inclined to call in question the propriety of what was done and advocated by these early operators, I fancy that a better style of surgery has made such sweeping proceedings scarcely needful. It does not appear that much was done in former times for the removal of such growths. A few rare cases have been recorded on which operations were performed; but such proceedings were far between, and had no position in the roll of our operations. So when modern surgeons began the excisions now so extensively recognised, tumors of a large size were more frequently met with than in the present time; and hence, perhaps, the necessity of reaching those outside points that I have just referred to. But in recent days the surgeon interferes at an earlier date, and before a tumour has implicated the bone extensively. It is in such instances that I believe there is room for improvement both in diagnosis and practice, and it is here that I make so bold as to propose that which I conceive to be different from ordinary accredited proceedings.

In operations on this bone, as on the lower jaw, and as with bones in other parts of the body, I take the liberty to protest

against the doctrine that the whole bone must be taken away when there is tumour present. Indeed it is largely in consequence of what I have seen in the maxillæ that I have come to the practical conclusion that total excision is not always needful in the case of tumours.

Again I express my conviction that, in removing diseases of the upper jaw by the extensive separations referred to, the modern surgeon has been amply justified ; but I feel equally confident that in many cases there is, or has been, no need for such destructive work. The malar bone, for example (separated, be it observed, by an articulation from the maxilla, and therefore not within the scope of certain so-called physiological or anatomical laws) has often been removed, although there has been no trace of disease upon it ; but all for the sake of making sure of the total extirpation of the jaw-bone. Now I make bold to say that all this destructive surgery may in many instances be avoided, and that partial excision will prove, on the whole, as effective here as I am convinced it does in other parts. In certain instances the malar bone may be saved ; in others the surface next the pterygo-maxillary fissure need not be interfered with ; in many the floor of the orbit need not be touched, nor the nasal surface, nor the palatine plate. Much regarding these views will depend on the individual character of the disease ; but of this I am convinced that in the majority of such cases one or other of these parts may be saved. It is scarcely possible to overrate the advantage of saving one or more of them, nor do I doubt that a general feeling must be on my side in this opinion. But the question may be asked, How can such parts be saved ? My answer is, to let them alone when they do not seem to be involved, But, again, it may be asked, How can you let them alone if division is to be effected at such extreme points as the zygoma, at the outer side of the orbit, the apex of the nasal process, the junction with the other maxilla in the mesial line at the alveoli below the septum, along the roof of the mouth, and also at the palatine junction with the palate bone ? Hard questions seemingly ! yet, in my opinion, as easily answered as anything associated with conservative surgery. Just take away that which is in disease, and leave that untouched which is in health.

But, supposing the doctrine which I advocate admitted, how can this be done effectually ? And here I come to one of the chief objects of this lecture. My view is, that instead of attacking disease of the upper jaw at its circumference, as has been the almost invariable practice since Gensoul's proposal to excise the whole bone, it is better to get into the disease as it were, and cut from the centre to the circumference, making sure that in doing so, that circumference shall be thoroughly

encompassed. But where, it may be asked, are the instruments to do this? It was an old practice with the chisel and mallet, but it did not answer! These are the instruments (Figs. 1, 2, 3, and 4), small saw, bent forceps, and gouge. The saw (Fig. 1) commonly called Hey's, these bent forceps (Figs. 2 and 3), and the gouge (Fig. 4), are almost essential to the process I am now

FIG. 1. FIG. 4.

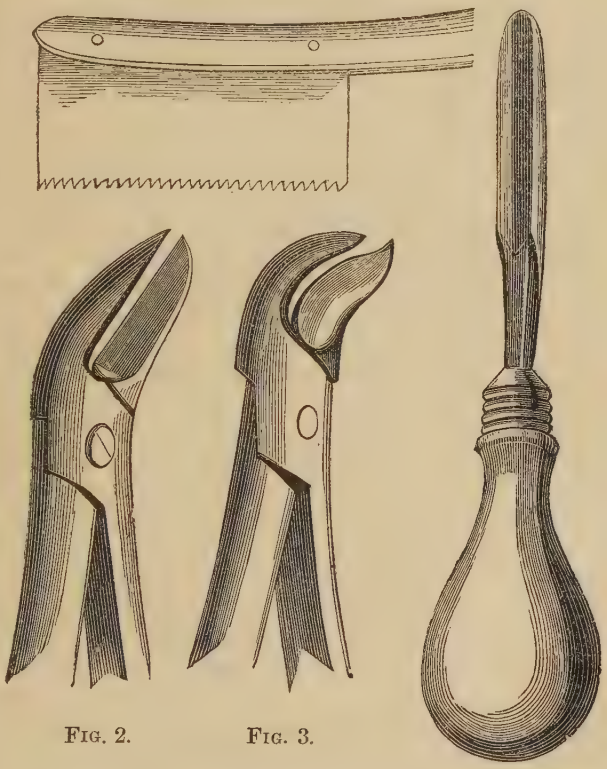


FIG. 2. FIG. 3.

referring to. The saw may be dispensed with, but the forceps and gouge are well-nigh absolutely requisite. My opinion is, that in such operations, if the great mass can be removed by

adequate cuttings at convenient parts, any remaining portions may be readily clipped away by such forceps as these, or scooped out with the gouge; the rule being to clip or gouge until healthy surfaces are reached; and if this cannot be done, for fear of going too deep, then the surgeon may conclude that the disease has gone further than he calculated, and that it is beyond the reach of operation. By such a course as I now have indicated, I have frequently cleared the upper jaw of its diseased deposits, and left both orbital and palatine plates entire, and, as a matter of course, the posterior surface. The nasal side of the bone I have never taken much into account in these cases, for I think it of little consequence compared with the intention and magnitude of the operation.

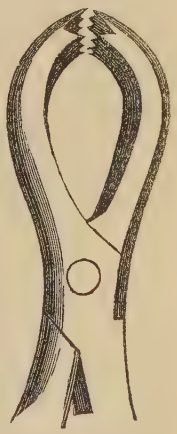
After all my experience and repeated trials, I have latterly formed a strong opinion that the features of the face may be better preserved than as yet by the generality of surgeons; and my anxiety to impress these views is certainly not the least object of this lecture. First, I consider that many tumours of the upper jaw may be summarily removed without cutting the lips or cheek at all; and next, should more space be needful, it may be gained at less cost of feature than has generally been supposed. In dealing with the upper lip for removal of tumours of the upper jaw, I greatly object to any other incision than one in the mesial line, which must be run into one, or both nostrils if required. There are two advantages of great importance, in my opinion, associated with this incision. First, the wound. being made in the furrow below the columna, and exactly in the middle of the lip, is less observable than on any other part; and next, there is an inch in length gained by the natural opening of the nostril. The ala of the nose is so easily raised, and with the tip can be so easily moved according to the will and wish of the operator, and the cheek can be so readily dissected off the tumour as high as the margin of the orbit and as far out as the malar bone, that a large space for operation on the anterior surface of the maxilla is easily made. Since 1848 I have never made any other incision in the upper lip; and I have no hesitation in stating, from experience of twenty cases or more, that in a number of operations of moderate-sized tumours there is no need for more extensive incisions on the outer surface of the face.

Should it so happen that, the tumours being large, more room is required, I am further led from my experience to prefer an incision alongside the nose, and a horizontal line, to those of Gensoul or Lizars on the cheek. By these incisions through the lip, up the side of the nose, and along the lower eyelid, as far out as may be needful, say even to the zygoma, all the room required for the removal of a large tumour may be secured, and

the most conspicuous part of the cheek may be left untouched. Another great advantage which I claim for these incisions is that the chief vessels of the surface are all divided at their narrowest points, and thus hemorrhage is less severe than when the facial artery is divided in the middle of the cheek, as in the common incision.

I am unable from want of time to dwell longer on this subject; but, before concluding, I must state my impression that the views regarding operations on the upper jaw, to which I have now drawn attention, and which, whether for good or for evil, I must claim as my own, cannot be carried out excepting by the use of such instruments as are here shown (Figs. 1, 2, 3, 4). The Hey's saw and the gouge were familiar to surgeons before my time. The straight cutting forceps, depicted by Scultetus in former years, and brought into fashion in modern surgery by Liston, are of limited use in such instances; and where prejudice or ignorance does not prevail, they may be said to be entirely set aside by these angular ones, (Fig. 2) which effect all, and even more than the straight ones. But in particular these semicircular clippers (Fig. 3) will be invaluable; and, with curves of different circles, the largest tumours may be circumscribed by them. If even some of the tumour should not come away with the mass, the blades will enable the surgeon to remove the whole, and clip upon the healthy surface.

Fig. 5.



Whilst recommending these angular and semicircular forceps, which I claim to have originated for surgical purposes, I cannot omit referring to these additional blades (Fig. 5) as being of the greatest imaginable value in the removal of some tumours in the upper jaw. A quarter of a century ago, in imitation of an older custom, small hook-beaked blades were used for seizing arteries on stumps and other open surfaces, when ligatures were required. They were likewise of use in seizing and holding small tumours during removal. It was Mr. Liston who, I believe, gave them the name of the bulldog forceps. In my early experience in operations on tumours of the upper jaw, I had observed the difficulty of separating them, even after a free use of saw and forceps; and this instrument was a device of my own to facilitate that step. The commanding size and strength of these blades give facilities for wrenching out a tumour of the upper maxilla previously unknown. Their grasp is such that,

in comparison with the others. I call them the lion forceps; and they are now well known under that name, although not so well by my own, for it is not long ago that a London hospital surgeon, who, being provided with one of them for an operation he was about to perform, asked me if I had ever seen the instrument, and kindly directed my attention to it as one of peculiar merit! In operations on the lower jaw it will be found of wonderful service in keeping all steady during the application of the saw or in disarticulating; and in various operations elsewhere, when a stronger catch than the fingers can give is required, their use in my hands has added largely to the value of my digital resources.

In the preparation of this lecture I had sketched the chief features of diseases associated with the jaws, and particularly those associated with the antrum; but I found it impossible to keep all within the appropriate limits, and, being anxious during such an opportunity as this to state my views and practice when operations are required in such cases, I have thought it best to omit that which in my estimation had less of the aspect of novelty than the portion which I have now submitted to your notice. You may have observed that here, as in certain other departments of pathology and operative surgery, my mind takes a strong local bias, and I advocate what some may think or call restricted measures, in preference to those of a more sweeping kind, which involve the destruction and loss of a considerable amount of sound substance around. I trust that I shall not be misunderstood here. I advocate the removal of all disease when an operation is really undertaken for tumours. If there is no malignancy, there is, according to rule, no need for taking away more than the disease. If a sound surface is left, that is all that the surgeon need care about. If the disease be malignant, I have great doubt if cutting widely beyond it makes much, if any, differance as to its return; and this pathology I apply particularly to malignant tumours in bone, for very generally when there is a return, it shows in the soft parts more than in bone. Of course I willingly admit that every now and then the renewed mischief really does come in the bone; but that feature should, in my opinion, contribute to form the exception rather than the rule for such operations as we have had under consideration to-day. In addition, and in some degree to give reasons why I advocate conservatism in their performance, I may state that I entertain views as to the original and early seat of many of these tumours about the antrum which are in some respects peculiar. Most surgeons, I believe, have an impression that when a person is said to have a tumour in the upper jaw, or, to be even more precise, in the antrum, the whole of this cavity, with its walls, is so involved

that in any operation for removal there is an absolute necessity that this circumference—the walls of that cavity—must be taken away. Now it is my opinion that disease in the antrum, beginning in the cavity as it were, is much more rare than most people think. My impression is, that in many, if not most, instances the wall of the antrum is the part first affected, and that its cavity is gradually filled by the growth, and then perhaps expanded. Actually, in some instances, so strictly local is the disease that the antrum may be in a manner displaced and compressed, whilst its mucous lining remains without indication of disease. This I have particularly noticed in tumours which have had their origin in the alveoli; and I have seen frequently growths of considerable size here which have projected forwards, downwards into the mouth, and even upwards, and yet have left the antrum scarcely if at all involved. Any part of the circumference of the antrum may be the original seat of a tumour, and if such tumour be attacked by an operation at an early date, I maintain that it may be removed, and the rest of the antrum or jaw be left. If it so happens that the tumour is chiefly associated with the posterior wall or part of the antrum, the diagnosis will be more difficult, and if an operation is performed the destruction of comparatively sound parts in front must be extensive in proportion; but if the tumour happens to be at any other surface, it is in my opinion of great importance to reserve as much as possible by removing only the offending part. It is unfortunately too often needful, owing to the extensive development of the disease, to remove all between the tongue and the eyeball; but cases are frequently met with of a more limited extent, and if the surgeon follows the practice which I have ventured to characterize as a modern improvement—viz., to interfere at a reasonably early time, so as to arrest the tumour in its onward progress, he may remove the disease, and yet save the greater part of the upper maxilla. In one case the sacrifice of only the inner or nasal wall of the antrum will suffice; in another the front may alone require removal; again, probably the floor of the orbit or roof of the antrum may be involved, or possibly only the lower part of the antrum—that is, the roof of the mouth, with, perhaps, the alveoli. To save the floor of the orbit, as happily may often be done, is in my opinion of great importance; but of all these local operations that I am now advocating, that of removing disease, and at the same time preserving the roof of the mouth, is the one of most importance in my estimation, and, where the extent of disease will permit, the surgeon should make every effort to do so. I have known a sound alveolar ridge, a perfect set of teeth, and one side of the roof of the mouth all sacrificed to get at a comparatively

small tumour in the antrum, which could readily have been removed with the sacrifice of only the front wall of the cavity.

But time tells that I must cease, and I shall do so after a few words more.

The dread of hemorrhage was great in the early days of these operations, particularly when the upper jaw was affected, and it was the custom for a time to begin by tying the common carotid; but that practice was soon given up. Vigour and rapidity of action are the best safeguards against this danger.

Every now and then one hears objections to chloroform in such operations. For my part I have none. I have used it invariably since the introduction of anæsthesia, and I have never had reason to trace evil to it. It has seemed to me a greater boon to a patient in such an operation than in almost any other, for there are few more severe or frightful in the whole range of surgery.

In offering these observations, I speak from a personal experience of between thirty and forty cases. Twenty of them have been performed in King's College Hospital. I did not scruple in my lecture on Lithotomy to tell the fatality of that proceeding in my own hands; nor need I hesitate here to remark upon the seeming comparative immunity to life of operations on the jaws, There have been returns of disease and ultimate deaths, as with cancers and fibro-recurrent tumours elsewhere; but of the whole list of my cases I have lost only five—a success which, as compared with lithotomy, seems remarkable, particularly when we take into consideration the huge wound in the face as contrasted with the limited incisions in the pelvis.—*Lancet, July* 1, 1865, *p.* 1.

39.—ON TREPHINING FOR COMPRESSION OF THE BRAIN FROM FRACTURE OF THE SKULL, WITH REMARKS.

By Bamlet W. Switzer, Esq., Assistant-Surgeon Bengal Medical Service.

It must sometimes be a perplexing thing to a surgeon when he purposes to trepan to know where he ought to make his incisions in an unwounded scalp, with nothing external to guide him, and the whole scalp so swollen as to render manual examination useless. From a number of cases of this kind which I have seen, I may safely say that in nine out of twelve the left parietal is the fractured bone. A man striking another with a stick holds it in his right hand; it is, therefore, brought down on the left side of his antagonist facing him—the reverse, of course, if the blow is given from behind. In these cases the bone generally gives way where struck. Fracture by *contre coup*, I do not think, takes place except by a fall. Cases are recorded

of men falling on the head fracturing the skull opposite to the place of contact, or fracturing the base; but I do not remember to have seen any case of *contre coup* fracture from a direct blow of stick or stone. The rule I would therefore deduce is, that, in the absence of any symptom or sign to guide the surgeon, the history of the case would point out the practice. In the case of two men fighting with sticks the fracture is to be sought on the left side; if it is a man found insensible on the road, and who, most likely, has been struck from behind, I would try the right side. Hemiplegia is in general a safe guide, but should never be one when the fracture can be felt. Trephining at the fracture is the practice, even when the paralysis is at the same side, for the compression causing it is, doubtless, blood, that a free opening into the skull, even at a little distance from it, will evacuate. It must have been a very small part, indeed, of the clot on this man's dura mater that I was able to remove, but the prising up of the bone took the pressure off immediately. The large amount of blood this man lost was most salutary; no sign of inflammation occurred through his progress to recovery. Except for the first few days, when he was on tartar emetic mixture (carefully watched to prevent emesis) and an occasional purgative, he required no further treatment. One cause of the non-success of trephining, I believe, is its being delayed too long: pressure on the brain for a few hours is productive of far more mischief than an early operation is likely to cause; besides, the patient is better able for it early than late. I need not digress on the operation itself; it is exceedingly simple and easy of performance. Tetanus is said to have resulted from jagging the dura mater with the saw, but that can be readily avoided by plumbing the depth of the cut by a pointed quill, and cutting with a light hand when through the diploe. I would always encourage bleeding from within the skull when not coming *per saltum*. Nothing tends more to relieve the brain or prevent after bad consequences. Even had the operation eventually proved fatal from secondary causes, it might in many cases be of great present use in restoring temporary consciousness, and thereby allowing a man to settle his worldly affairs or prepare for the last great change.—*Medical Times and Gazette, Aug.* 26, 1865, *p.* 220.

40.—ON ACUPRESSURE.

By Dr. William Pirrie, Professor of Surgery in the University of Aberdeen; Surgeon to the Royal Infirmary of Aberdeen.

[Professor Pirrie's experience of acupressure as a hæmostatic agent, comprehends its use in five amputations in the middle third of the thigh, one amputation of the leg below the knee,

two cases of removal of the mamma, and one of excision of the elbow joint; also several cases in private practice.]

Before giving a brief record of my experience of this hæmostatic agent, it may be advisable to describe very shortly the principal methods of acupressure hitherto employed. They are seven in number.

The first method, to use the words of Professor Simpson, "consists in passing a needle through the flaps or sides of the wound, so as to cross over and compress the mouth of the bleeding artery or its tube, just in the same way as in fastening a flower in the lapelle of our coat, we cross over and compress the stalk of it with the pin which fixes it, and with this view push the pin twice though the lapelle. The only portion of the needle which is left exposed internally on the fresh surface of the wound is the middle portion of it, which bridges over and compresses the arterial tube at its bleeding mouth, or a line or two or more on the cardiac side of it. And if it were a matter of any moment, this part need not always be left bare, for the needle could be often passed a few lines higher up, between the vessel and the cut surface, and without emerging on that surface. More or less of both extremities of the needle—viz., its head and point, are exposed externally on the cutaneous surface of the side or flap of the wound. When passing the needle in this method, the Surgeon usually places the point of his left forefinger or of his thumb upon the mouth of the bleeding vessel, and with his right hand introduces the needle from the cutaneous surface, and passes it right through the whole thickness of the flap till its point projects for a couple of lines or so from the surface of the wound, a little to the right side of the tube of the vessel. Then, by forcibly inclining the head of the needle towards his right, he brings the projecting portion of its point firmly down upon the site of the vessel, and after seeing that it thus quite shuts the artery, he makes it re-enter the flap as near as possible to the left side of the vessel, and pushes on the needle till its point comes out again at the cutaneous surface. In this mode we use the cutaneous walls and component substance of the flap as a resisting medium, against which we compress and close the arterial tube. But in some wounds a neighbouring bone or other firm unyielding texture forms the best and readiest point of resistance against which to pin and compress the artery by the acupressure needle."

The second method consists in inserting the needle in the fresh surface at a little distance from the vessel, pushing it on, causing its point to rise up as near to the artery as possible, bridging over and compressing it, dipping the point of the

needle into the raw surface of the wound on the other side of the vessel, forcing it on, and causing the needle to emerge a second time on the wound. The needle is threaded with a passive iron wire, by which it can be easily withdrawn.

The third method consists in entering the needle on one side of the artery, pushing it behind, causing its point to emerge on the opposite side of the vessel, passing a loop of inelastic iron wire over its point, bringing the wire over the track of the artery and behind the stem of the eye-end of the needle, drawing it sufficiently to close the vessel, and fixing it by a twist or half a twist around the needle. The wire with which the needle is threaded should be twisted that it may be readily distinguished. By means of this twisted wire the needle can be pulled out, after which the loop of wire is liberated, and can be easily withdrawn.

The fourth method, or that by a long pin and a loop of passive iron wire, is a modification of the third, and differs from it only in a long pin, with a glass head, for facilitating the insertion, being substituted for the common sewing needle threaded with iron wire. Perhaps of all methods the third and fourth are the most secure. The principle in each is the same, but I like the modification of using long pins when convenient from the form of the wound, as they can be so quickly introduced, so readily withdrawn, and all wriggling and entanglement of different kinds of wires with each other avoided.

The fifth method, or that by the twist, may be varied according to the extent of rotation of the needle, whether to a half or quarter rotation. The operator has, on the cessation of bleeding, a reliable proof that a sufficient degree of rotation has been given to the needle. This method may be practised with a long pin or with a threaded sewing needle, and with either it can be very quickly done, but of all methods of acupressure that by the twist with a long pin is the quickest.

In acupressure by the twist to the extent of a half rotation of the needle, the three first movements given to the needle are precisely the same as in the third method above described, namely, it is entered on one side, pushed behind the artery, and its point is made to emerge on the opposite side. The needle is then twisted over the artery and fixed on the parts beyond. In this method the artery is, to a certain degree, both twisted and compressed. The first time I tried the method by the twist, a half rotation was given to the needle; but as so little pressure, when direct, is sufficient to arrest hemorrhage, in other cases a quarter rotation was only made by it. The needle was sent by the side of the artery, a quarter rotation was given to it, and then secured by sending its point into the soft parts. This is the simplest, quickest, and easiest of all the

methods by the twist, more especially when done with a long pin, and as far as experience in the Aberdeen Hospital warrants opinion, perfectly efficient. The gentlemen who were present in the theatre of the Hospital at the first operation where I tried acupressure by the twist were particularly struck with the great simplicity of this method as well as the facility with which it could be employed; but as the manœuvre with the small needle could not be distinctly seen from a distance, they were curious to see, after the removal of the patient, a demonstration I gave of this mode, in which I used a large needle and the mouth of the femoral artery in the amputated limb.

Professor Simpson used this method early in the history of acupressure in cases operated on by Dr. Handyside and Mr. Edwards, but he had published no account of it when the same method occurred as a perfectly original idea to the mind of Dr. Knowles, formerly House-Surgeon of the Aberdeen Hospital, who suggested this method without the knowledge that it had been devised by Professor Simpson, and I felt anxious to give it a trial. I did so in the Aberdeen Hospital on June 29, 1864, in an amputation of the thigh. This was the first instance in which the femoral artery was secured in this way, and the first time this method had ever been tried. It is no part of the fifth, or Aberdeen method by the twist to transfix the artery; on the contrary, great care is taken to avoid doing so. It is important to be aware of this circumstance, that there may be no confusion between this method and the sixth, in which the artery is transfixed. In practising the Aberdeen method by the twist, the first movement of the needle may be made to consist of its insertion by the side or underneath the artery, as may be most convenient for having its head towards the edge of the wound when the quarter rotation has been made.—*Med. Times and Gazette, July* 1, 1865, *p.* 5.

41.—CASES IN WHICH, AFTER AMPUTATION, ACUPRESSURE WAS EMPLOYED FOR THE ARREST OF ARTERIAL HEMORRHAGE IN THE ABERDEEN ROYAL INFIRMARY.

By Dr. William Keith, Lecturer on Clinical Surgery and Senior Surgeon to the Royal Infirmary, Aberdeen.

Case 1.—*Leg.—Flap Operation.*—William F., aged 14. Diseased ankle-joint. On January 6, 1864, amputated the leg at mid-length; three needles employed, looped over. Two of the needles were removed at the end of forty-eight hours, and the third one at the end of seventy-two hours. No oozing after the operation, and no hemorrhage at or after the removal of the

needles. The wound was closed by wire sutures, and healed by first intention.

Case 2.—*Thigh.—Flap Operation.*—Mrs. M., aged 29. Diseased knee-joint of three years' standing. On November 16, 1864, amputation at the middle of the thigh by the flap operation. Four long bead-headed shawl-pins with wire loops were employed for securing the larger vessels, and two small needles for muscular branches. Wound closed by wire stitches. No hemorrhage followed; the after ooze seemed less than usual. Seventy-two hours after, the two small needles were removed; at the end of other twenty-four hours, three of the long pins were withdrawn; and, lastly, the long pin controlling the femoral artery was taken away one hundred and twenty hours after the operation. Not a drop of blood followed the removal of any of the pins. The wire sutures, causing no irritation, were not removed till December 4, eighteen days after insertion, by which time the wound was whole. It adds interest to this case to state that it was announced beforehand that acupressure was to be put on trial, and the case was consequently closely watched from its commencement to its close.

Case 3.—*Forearm.—Flap Operation.*—Peter P., seaman, aged 54, recurrent fibrous tumour, extending from the palm of the hand up into the forearm. On January 21, 1865, amputation performed by flap operation, six inches above the wrist-joint. The bleeding from three vessels completely controlled by a long pin and one needle. Erysipelas, present in the ward at the time, affected the stump for a few days, but in no way hindered the removal of the needles or the union of the wound. In four weeks he went home to Shetland sound and whole.

Case 4 —*Leg—Flap Operation.*—Lauchlan G., aged 18, railway porter. Had his left foot crushed to pulp by the wheels of a loaded waggon having passed over it whilst lying on the metal rail. This happened at 1 p.m. on January 24, 1865; he was brought a distance of thirty-six miles, and arrived at the Royal Infirmary, Aberdeen, at 8 p.m. the same night in a very exhausted condition. Reaction established, by the end of sixteen hours after admission, the leg was amputated a little below the middle at 12 noon on January 25. Four arteries required to be stopped, and this was done by Simpson's pins with wire loops, and the wound was closed by wire sutures. On account of the molecular injury which the tissues forming the flaps were feared to have sustained (no retraction whatever taking place in the gastrocnemius and soleus muscles when cut), the stump was at once laid in a warm poultice.

January 26. Stump a little swollen and red, the swelling extending up the thigh. The patient otherwise as well as could be expected. Continue the poultice.

27th. Stump and thigh considerably swollen. Continue the poultice. The four pins were this day removed forty-eight hours after insertion, and not a drop of blood followed. The patient's state satisfactory, but the pulse is to-day more frequent than hitherto.

28th, 12 noon. Stump looks well; swelling much relieved; patient's condition much as yesterday. At 8 p.m. he had a severe rigor, followed by great prostration. Pulse scarcely to be counted; intense thirst, and in a state of approaching coma. Mustard cataplasms to the nape of neck, and wine.

29th. Patient sensibly improved. Takes sustenance, but still drowsy, and feels very faint.

31st. In spite of every effort he sank at 11 30 a.m. this day.

Inspection of Body Twenty-four Hours after Death revealed the evidence of acute phlebitis in the saphena major vein of the injured limb; the coats of the vessel were thickened, and it was filled with a white, thin, sero-purulent looking fluid, not even tinged with blood. The deep-seated veins were all sound and healthy. The kidneys were greatly injected and friable. The stump was made the subject of very careful dissection. The flaps were easily separated; no coagulum of blood was in the wound; one red stain, the size of a four-penny piece, tinged the flesh at the end of the posterior tibial artery, and that seemed all the effusion of blood that had followed the closing up of the wound. The mouths of the anterior tibial, the peroneal, and the posterior tibial arteries lay open to view. Their ends were abrupt, solid looking, not much retracted, nor in any great degree contracted, but filled up by organised fibrine or lymph, as solid to the look, and almost as much so to the feel, as the coats of the vessels. The popliteal and these three vessels were dissected out together, and showed, on trial, as perfect occlusion at the cut ends as I have ever witnessed. On slitting these vessels from above downwards the following observations were made:—The peroneal artery was firmly plugged at its cut end for one-fourth of an inch by a colourless, fibrous-like tissue indissolubly united to the lining arterial coat. No conical continuation of the plug extended farther up that vessel. The anterior tibial was in like manner completely occluded; the vessel, when slit up, revealed a short conical continuation of fibrine, pointing upwards, its further progress having no doubt been hindered by two small branches in close proximity passing off from the main vessel just above the tip of the clot. The posterior tibial was very effectually closed by a well-plugged mouth, and inside by a conical extension of the plug upwards to fully half-an-inch; the tissue composing it slightly tinged with blood, the plug and the cone being one and the same mass. The vasa vasorum had evidently maintained

the vitality of the arterial coats, so as at once to commence the vital and healing process of exudation of lymph at the cut ends, all the more readily that the cellular attachments around had never been disturbed.

Case 5.—*Thigh—Flap Operation.*—March 6. George R., aged 12, parish of Newhills, labours under necrosis of the tibia of right leg; extensive abscess of the thigh surrounding the knee-joint and diagnosed to communicate with the joint; the boy greatly reduced in flesh and strength. The collections of pus were one after another freely emptied by incisions, and his strength recruited as much as possible by rest and generous diet, but it was the 3rd of May before matters were quiet enough about the limb to admit of amputation with any chance of success.

At 12 noon of May 3 the limb was removed at mid-thigh, under chloroform, and five arteries were speedily pinned under and looped over by a wire loop. The wound was closed by wire stitches; no dressing applied; not an ooze has followed the closure of wound. The pin heads varied in colour so that each vessel was individualised by the protruding pinhead, while the length of each pin selected was regulated by the distance of the artery from the margin of the wound, the head visible outside, the free point for steadiness being stuck into any adjoining muscle. At 8 p.m. the same day not a drop of blood had exuded from the wound, although it was then discovered that he had drawn out three of the pins and one of those securing the femoral.

May 5. Wound adherent throughout; not an ooze of blood from the wound, or even serum; boy in good spirits. To have meat diet, and four ounces of wine daily.

7th. The remaining two pins were removed to day. Some pus followed the withdrawal of each, but not a tinge of blood. Had considerable headache yesterday, which was removed by free action of the bowels.

8th. Going on favourably, but very weak. To be allowed 6 oz. of wine daily.

18th. Last of stitches removed yesterday; wound united with little suppuration.

24th. Stump quite whole. Boy is up every day.

June 20th. The stump has been whole for a long time; but he has been kept in the house on account of his exhausted condition. Discharged to-day quite cured, forty-eight days after the amputation.

Case 6.—*Arm—Circular Operation.*—G. W., boiler-maker, aged 45, was admitted on June 8 with lacerated arm. About 10 o'clock the same day, while working at a foundry, he was caught by a belt and carried round a revolving shaft near the

ceiling, between which and the shaft he was pinned. The machinery was immediately stopped and the man extricated. The only injured part was the left arm, which was almost torn through at two places. The flexor muscles of the forearm were severely lacerated, the ulna and radius fractured, and the broken ends of the bones protruded through the tissues. At the elbow there was similar laceration of the soft parts for some distance above and below the joint, and the forearm was completely torn away from the humerus. Amputation by the circular method was performed about six inches below the acromion process. Six arteries bled. The brachial was secured from outside the skin by Simpson's first method, using simply the long pin. Two others of some size were secured by the third method, that of needle and loop, and three lesser by the needle twist, or Aberdeen method, known as the fifth mode. The stump was left exposed.

On the 11th the stump was tumid, and a livid patch appeared on the front. Four of the needles were removed. He was ordered 8 oz. of wine.

On the 12th the pin compressing the brachial artery was removed.

On the 14th all the stitches were removed; the stump was still red, but less tense, and was discharging pus freely.

On the 18th the slough which had formed separated, and was taken away; the sixth pin, the head of which had been concealed by the tumefaction of the stump, was removed; he continued to progress favourably, and on July 15 was dismissed, sound and whole.

Case 7.—*Arm—Flap Operation.*—John G., aged 29, labourer, admitted July 6, 1865, for a crushed elbow. About 11 o'clock on the same forenoon, while carrying a large stone on his back, his shirt became so tightened about his neck, in consequence of the stone dragging it down, that he fell down in a state of insensibility, and the stone fell on the left elbow. The elbow was so crushed that amputation by the flap operation, about nine inches below the acromion, was resorted to. Four arteries were acupressed—the brachial by the pin and loop and other three by the twisted needle. The stump was left exposed. No blood oozed from the wound. On the 8th one needle was removed without a drop of blood, and on the 9th another, followed by three drops of blood. On the 10th all the stitches were removed, and on the 11th the pin controlling the brachial artery, with the loss of two drops of blood. The wound suppurated a little, but he went on favourably, and on August 3 was dismissed cured.

Dr. Greig, of Dundee, was the first surgeon who trusted entirely to acupressure in a case of amputation. On January 6,

1864, I followed his example in the operating theatre at Aberdeen on a leg ; ligatures were ready in case of need, but no need occurred ; the case speaks for itself. On the occurrence of the second case—amputation of a thigh—I gave previous notice to my clinical class and the hospital staff that I meant to put acupressure on trial and trust entirely to it. The result was most satisfactory and conclusive, and led to its adoption most cordially by my colleagues Drs. Pirrie and Fiddes. The former has spoken for himself, and for the latter I have his authority to say that his reliance on the practice is entire, but more especially on the Aberdeen mode known as Knowles' needle twist. In my third case—of forearm—the simplicity of needle pressure by Simpson's first mode was striking. Entering from without through the skin, under the radial, out through the skin, crossing a portion of skin, and passing under the ulnar artery with the same needle in an exactly similar way, left only the interosseous to be secured, which was readily effected by a small needle and the half twist, or fifth method.

The fourth case presents many features of interest. The injury sustained by the patient was severe ; his journey was long and fatiguing, and he lost much blood by the way, all tending to place his life in jeopardy, and lessening surprise at his death in the end. Yet he was got into a fit enough state for operation, bore it well, and gave promise for some days of getting through. He survived till the eighth day, affording ample time for the complete occlusion of the arteries—four in number—cut and secured at the operation, a long pin and wire loop (according to Simpson's fourth method) having been employed for each artery ; and at the end of forty-eight hours these were all removed, not a drop of blood following them or afterwards. The vital and effective closure of the vessels during life was demonstrated by the dissection. The process of lymph plugging, so familiar to all who have followed Jones through his experiments on the arrest of hemorrhage, is well seen in the preparation made of the vessels of the leg in Case 4.

In the fifth case (amputation of the thigh in a boy aged 12) an occurrence happened not at all desirable, but still instructive. The restless boy amusing himself with the pin heads protruding at the angles of the wound, had, before four hours had elapsed, withdrawn three of them ; yet no hemorrhage took place. I applied no substitute, and yet all did well. It would, therefore, appear that four hours' pressure would suffice to perfect coagulation sufficiently to shut any artery ; for the femoral was one of those relieved of its supporting pin. Although no one will, I presume, advocate such an early removal of a useful means of support and control, yet it gives great strength to the

affirmation that at the end of forty-eight hours the needles and wire loops may be safely and confidently removed. In the other cases, it need only be noticed that the method of needle pressure varied according to the position of the vessel—at times a long pin through the skin, over the vessel and out again, without a loop; at others, a short needle with a wire attached to withdraw it by, and the vessel looped over by a wire; and at times, again, the Aberdeen twist, which is truly a simple and secure mode of proceeding, and has this additional to recommend it, that it can be so easily withdrawn without disturbing the vessel or surrounding tissues in the very slightest degree. Whether a short needle with wire attached to its eye is employed, or a long bead-headed pin with which to secure the vessel by the twist, you have, on withdrawing it, only to pull gently in the line of direction in which the needle or pin already lies, assisting the pin with a slight rotation before beginning to draw; and as nothing really grips it, no difficulty is ever felt in the proceeding. The same can hardly be said when a wire loop has been employed. The loop to secure the vessel passes first over the pin point after the pin has passed under the artery, then the wire passing over the artery is made to embrace the pin stalk below its head, and that pretty securely too—all very right, and in some degree necessary; but when the hour comes for withdrawing the pin or needle, it is not found to come quite so easily away. Of course it comes, but with a little drag, and when the needle has been withdrawn, the wire loop has yet to come. As it had an eye at its further end, was bent a little over the vessel, and twisted not a little round the shank of the pin or needle, there remains a crooked wire to bring away after the pin or needle is out. It also comes away with a drag, usually paining the patient a little, and what I feel always most anxious about is, lest the wire should in its progress out drag the vessel so as to loosen its closing plug. No such thing has happened in any degree within my own experience or observation of others; yet I deem it fair to point attention to the circumstances that all will have to encounter, and I adduce it as one chief reason why my colleague, Dr. Fiddes, all but invariably gives the preference to Dr. Simpson's fifth method—viz., by the quarter or half twist without wire loop pressure at all. When the loop is employed, the objection I have just stated is most easily obviated by using a wire simply doubled without being at all twisted, and by undoing the closing twist fully before withdrawing the needle. In all cases reference should be had in the selection of pins and needles to the size of the limb about to be operated on, so that when the pin head is outside the flaps the point may in no case protrude at the other side, and if the point shows, better clip it off. While inserting the

needles, it is also advisable to regulate so that all may present at one or other angle of the wound (this is not absolutely necessary, but will be found convenient), and that a knowledge of each vessel may be distinctly preserved, pins with different coloured heads might be employed, or, if needles, silver or iron wire attached as required.

A little tact is no doubt necessary in introducing the pins or needles, whether through the skin or only through flesh and cellular tissue, but both are greatly facilitated in their movements by being provided with spear points. In penetrating from without, the index finger of the left hand laid over the vessel on the cut sides guides the pin point with great precision, at the same time preventing any flow of blood, and in passing a needle behind an artery of any great size on the cut surface of a flap it will be found very useful if an assistant would seize the mouth of the vessel and draw it a little out, steadying it while the operator passes the needle under it and while he applies and secures the wire loop over it. By this mode the proceeding becomes momentary indeed; much or little tissue may be allowed to intervene between the coats of the artery, and the surface of the pin or needle employed as the operator pleases. In the first method the artery should be crossed by the needle at a point where its sheath is entire, hindering, therefore, contact between the two; in the second, third, and fourth methods not only should the same be allowed, but a moderate portion of muscular fibre or cellular tissue will be usefully included to act as a cushion while compressing the vessel. In the fifth method less, but still a portion of the adjoining tissue should be entangled in the twist along with the artery, and the twist secured entirely by plunging the needle point deeply into the firmest soft tissue within reach, always providing by the lie of the needle for its safe and easy withdrawal when desired. It is unnecessary to repeat that inelastic wire is now exclusively used to close all amputation wounds; the stitches are allowed to remain in until the wound is healed, and no dressing is applied whatever.

The pins and needles employed should be soft-tempered, so as to bend rather than break, should be flat, sharp, spear-pointed, round in the stem, and of various lengths. Mr. Young, the Edinburgh cutler, is familiar with their construction, and Mr. R. B. Turner, of Redditch, is highly commended by Dr. John Burton of Walsall. At a very moderate cost, Mr. Turner supplies the needles electro-plated with gold—a process that will, by preventing oxidation, preserve the polish and purity of the needle for future use, but what is of still more importance, will hinder any gumming between the wire and needle, and so facilitate the withdrawal of both.

We desire to suppress hemorrhage promptly, effectually, permanently, after every surgical operation. Acupressure is equal to do all this, and in every emergency. Having secured the bleeding vessels and allowed time for the surface of the wound to glaze and every ooze of blood to cease, the wound is closed over an unirritating substance, so arranged as to be capable of being withdrawn at any moment whenever its work is deemed to have been accomplished, leaving a clean glazed wound already adherent face to face by forty-eight hours of undisturbed repose, and now relieved from the presence of any foreign matter whatever. What need hinder union by first intention? Yet we have been recently told by a surgeon of some eminence that this mode of treating wounds and wounded vessels is "a proposal that ought to be received with regret," and as the newest important suggestion in surgery, he enjoins the "leaving both ends of the silk ligatures with which the arteries in a stump have been secured protruding from the wound, to maintain an outlet for the discharge of fluids that might otherwise accumulate in the cavity." What cavity? The surfaces are carefully approximated with a view to healing by primary intention. What kind of fluids? All the vessels are closed, the ooze had ceased, and before any irritation is created the wire ligatures are withdrawn. I again ask, Where are the fluids to come from? To be sure, if after amputation of an adult thigh from five to eleven double silk ligatures are left attached, each pair to the strangulated end of an artery, and their ends traversing the length or breadth of the wound, as may be, and that for many days in succession—in truth, until time or chance liberate the ligature by the dead end of the vessel sloughing off—one need not wonder at what may follow in the way of morbid action or copious secretion either; but every unprejudiced person will see and acknowledge that the cause of all that is the presence of the silk ligatures.

In dealing with this question of needle pressure I am conscious of no thirst for innovation on the part of my colleagues or myself; and certainly we have not rushed into print with any undue haste; we calmly thought over it, coolly tried it fairly, and now, at the solicitation of others, give our unqualified approval of it as quite safe and quite sufficient for arresting arterial hemorrhage, having fewer after drawbacks than the mode by silk ligature. We do not need to condemn the use of silk thread more than do people condemn stage coaches where other conveyance cannot be had; but where a locomotive is available I suppose most people now-a-days would prefer it, and so with silk thread and acupressure.—*Medical Times and Gazette, Sep.* 9, 1865, *p.* 278.

42.—ON THE EMPLOYMENT OF ACUPRESSURE AS A HÆMOSTATIC AGENT.

By Dr. PATRICK HERON WATSON, Surgeon to the Royal Infirmary and Chalmers' Hospital, Edinburgh.

[Dr. W. relates nine cases in which acupressure was used for the arrest of hemorrhage after operations.]

At first sight, looking at these cases, it is apparent that there are nine cases of acupressure, with three deaths; and according to this common method of estimating the success of certain great operative procedures, such a result would be tabulated as a fatality in cases of acupressure of 33 per cent. But as hardly the most vehement opponents of this means of checking hemorrhage are inclined to go the length of charging upon it such disastrous consequences, it is unnecessary for me to say more on this aspect of the fact, than merely to show that this fatality was in every instance independent of the surgical proceedings resorted to for the relief of urgent disease.

In the first case (that of a strangulated inguinal hernia) the form of the affection,—congenital in the adult,—the protrusion occurring into the tunica vaginalis testis as its sac, is sufficient to indicate the likelihood of a fatal issue, especially when we consider that the protrusion had taken place on this occasion for the first time, that the apertures were very rigid and but slightly dilated; that the hernia had been incarcerated for certainly eight hours, and strangulated for at least two; that at the time of the operation the sac contained no fluid, and that the bowel was tightly constricted in no less than three situations. Furthermore, the fatal peritonitis was in all probability already established before the operation for the relief of the hernia was undertaken, as turbid fluid escaped from the abdominal cavity after the contents of the sac had been returned.

The second fatal result, in the case of the railway guard, occurring after amputation of both limbs, consequent upon a severe railway injury, attended with great constitutional shock, a long transit with consequently some hours' delay after the accident, and considerable loss of blood; is nothing more than what is usually observed in such circumstances. To the question of the recurrence ef hemorrhage after amputation, I shall again advert; but meanwhile I mention it merely to say, that its amount was so insignificant as to be incapable of seriously influencing the ultimate result.

In the last case which proved fatal, that, namely, of the farm-labourer with disease of the elbow-joint, and a large chronic abscess of the forearm and arm,—to all appearance the determining cause of death must be found in the epileptic attack, first followed by deep coma, and then succeeded by a violent state

of maniacal fury. It was during this period of deep stupor, followed by violence, that the bed-sore formed over the sacral region which originated the erysipelatous affection. That this was the direct cause of the pyæmic affection from which he died was rendered probable from the fact that, while there was no coagulum contained in any of the larger veins of the right arm, the right internal iliac vein was occupied by a coagulum originating in its posterior branches. When the epileptic convulsions, followed by stupor and then by mania, first appeared, I imagined either that this was due to some embolic cerebral lesion or to uræmic poisoning. No cerebral embolism, however, was found to exist in the post-mortem inspection; and the theory of uræmia, although so far borne out by a trace of albumen being discovered in the urine for a day or two, received no confirmation in the condition of the kidneys.

Passing from the consideration of these fatal cases, because, as I have already said, the unfortunate result is in no respect attributable to the employment of acupressure, instead of the ligature, I would wish to consider what bearing these cases have: 1st, Upon the question of acupressure as a safe hæmostatic agent; 2nd, Upon the utility and application of acupressure as contrasted with ligature, and other hæmostatics; and, 3rd, Upon the prospect it affords of expediting the process of healing by the first intention.

1. Is acupressure then a safe hæmostatic agent? This question, so far as my experience goes in its employment, I must answer in the affirmative. I should speak with submission, as no doubt I have never had any opportunity of employing it in any vessel larger than the posterior and anterior tibials, radial and ulnar arteries. My experience, however, such as it is, would lead me to have no hesitation in resorting to its use in the largest arteries which require to be secured in amputation, such as the axillary or femoral. Nay, such is my complete confidence in the trustworthy nature of this measure, that I should be inclined to employ some modification of it in preference to the ligature in the operations upon the continuity of arteries in the treatment of aneurism. Before leaving the hæmostatic capabilities of acupressure, I must say a word in regard to Cases Nos. 3 and 6, which have been alluded to in Mr. Syme's summary as examples of hemorrhage following the use of the needle.

In regard to Case 3,—the amputation of the forearm,—the bleeding from the flaps was easily stopped by the employment of needles, and when the surfaces were brought in contact there was nothing but a scanty oozing, such as must occur in every wound of similar extent. To have brought the edges and surfaces of the flaps in contact, however, while even this was going

on, would not have facilitated union by the first intention, and, as to obtain this was my chief aim, I left the edges of the flaps gaping in the intervals, between two and three points of suture, which were inserted only for the purpose of equalizing the margins. From the surface of the flaps there was undoubtedly no further bleeding of any moment; but in passing the deep sutures through the flaps, some arterial blood flowed along the track of one of the wires when it was first introduced, and came, I am inclined to believe, from the radial artery, which had been injured in the passage of the long needle. As the flow ceased as soon as the sutures were tightened, and as the trickling stream was arrested, when I saw the patient after his removal to bed, as, furthermore, my house-surgeon informs me all bleeding of any kind had entirely ceased some time before the hour of evening visit, and, as certainly no means were deemed necessary to arrest any oozing which did occur, as certainly Mr. Syme's house-surgeon only saw the case—not on account of bleeding—but to give the patient chloroform, while the additional sutures were inserted, I am compelled to conclude that there was no "after bleeding" of any consequence, certainly not more than is usually seen in cases of amputation, certainly nothing which needed interference, and assuredly that which did occur was altogether unconnected with the employment of acupressure.

In Case 6, there was bleeding repeated again and again from trifling vessels which did not bleed at the time of the operation, which were not previously secured by means of needles. This hemorrhage, therefore, was altogether independent, and unconnected with the use of acupressure. In the removal of one needle and its wire loop, some oozing did ensue, and in this case I certainly did re-introduce the needle and re-apply the wire, not because this was absolutely required, but because the patient had already manifested such a proneness to bleed from any open surface that I deemed it expedient to secure myself and the patient against even the possibility of any further oozing. Had I deemed the needle insecure and unsatisfactory, it is scarcely likely in such circumstances that I should have re-employed it, instead of resorting to the ligature. But even supposing in this example, copious hemorrhage had ensued when the needles were removed from the larger vessels, which was not the case, it still would not have prevented me in happier circumstances from resorting to the employment of acupressure; for the nature of the flaps, and the consequent impossibility of obtaining accurate co-aptation of the cut surfaces, rendered the probability of the occurrence of hemorrhage when the needles were removed, or while suppuration was going on, much greater than in the instance of amputation of the forearm, already com-

mented upon. In fact, I regard the case as a very severe test of the safety of the needles as a hæmostatic agency; and, as it stood this test so well, the dissection of the vessels exhibiting firmly adherent coagula, occupying their extremities, which required very considerable force to displace or to separate them from their attachment, I should be inclined to quote this case, not as an instance of the unsatisfactory nature of acupressure, so far as the arrest of bleeding is concerned, but as an instance of the trustworthy character of this procedure as a hæmostatic agency.

2. As to the applicability and utility of acupressure as contrasted with ligature and other hæmostatics. When acupressure was first proposed, the procedure consisted in introducing a long glass-headed needle from the cutaneous surface of the flap. This, after traversing the textures, compressed the orifice of the vessel, by passing across its track, and again emerging on the cutaneous surface. It, therefore, compressed the artery in a degree proportioned to the thickness and resiliency of the tissues, the directness of the ingress and egress of the needle, together with its own rigidity. Such a method was manifestly ill-suited for general application. Hence, I presume, it was that the statement was very generally accepted, that acupressure was limited in its application to a few situations. But modified as this agency has been in various different ways, I can conceive of no situation in the body where its employment cannot readily be resorted to. Certainly, of all these various methods, that is simplest in which a small-sized glover's needle, threaded with a loop of fine iron wire twisted into a single strand, or a common long hare-lip needle, is employed either to support a compressing loop of wire, or to obstruct the orifice of the vessel by rotation through the arc of a circle. There are situations too, such as the extirpation of tumours, or in plastic operations on the face, where, while the dissection is proceeded with, the bleeding, arterial and venous, is readily checked by passing a common pin, or, better, a steel pin with a glass head, in at the bleeding orifice, till its head compresses the cut surface. I have in several examples employed this method, and have had much reason to be satisfied with it, because it certainly saved loss of blood, while it avoided the necessity for the fingers of assistants embarrassing the operator, by being employed either mediately or immediately in compressing the bleeding vessels. After completing the operation, these pins are removed, and should the vessels again bleed, one or other of the more permanent methods of acupressure may then be adopted. The needles are of course more readily employed in some situations than in others. In open exposed surfaces, rather than narrow deep wounds, in flap operations performed by transfixion, than in

those by the circular method, or where the mouths of the vessels are cut even with the muscular tissues in which they are embedded. But even such circumstances offer no insuperable obstacle to their employment. The interosseous arteries in the forearm, the anterior and posterior tibials and peroneal in the amputation in the leg, certainly gave me no trouble in employing acupressure. There is one situation in which bleeding is sometimes troublesome, and where a needle seems to afford a satisfactory means of stanching the arterial flow. I mean when the hemorrhage obstinately comes from the nutrient artery of a bone, or from an unusually active branch of the vessel. In such circumstances a needle affords an easy means of stopping the bleeding, and may surely be admitted to be a very preferable hæmostatic to the actual cautery, a compress of lint, or a peg of wood attached to a ligature, all of which I have in such circumstances seen employed. The use of the needle, however, has appeared to me to be much more easy even in cases where the ligature can easily be employed. To use a ligature properly, the mouth of the bleeding vessel should be seized by the forceps or tenaculum, and secured by the ligature, including in its noose as little of the extraneous soft parts as possible. No such accuracy is required in the use of the needle in any of the methods recommended for its application; while, in acupressure, the degree of compression of the tissues is so slight, and its necessary duration so short, that no ill can arise from it, whatever be the nature of the textures included. I do not think, therefore, that difficulty of application is an objection to acupressure likely to arise in the mind of any one who has had an opportunity of employing it.

In the case of the ankle-joint amputation (No. 4), it will be observed, that while the bleeding was very copious, it came from no vessel of such size as to admit of the satisfactory use of a ligature. Possibly it may be said that sponging cold water over the wound, or leaving the flap open for an hour or so, would have sufficed to stop any such bleeding. I cannot say that this has been my experience in similar cases, where the bleeding, though free, came from so many open points as to render the use of ligatures to all of them out of the question. Certain it is, that the needles afford a remarkably easy means of securing the satisfactory stoppage of this continuous and copious flow from a number of extensive patches of surface. Again, in sloughing wounds or sores, and in cases of secondary hemorrhage, I think there will be little objection taken to the reasonable anticipation that acupressure will prove more satisfactory than ligature; and, again, in bleeding from the palm of the hand or sole of the foot, either in the form of acupressure or of filopressure, by means of a curved needle and wire suture,

we possess a means of stopping the flow more easily applied than the ligature, and neither so painful nor so likely to cause suppuration as the graduated compress. As compared with torsion, the necessity for the removal of the needles may be urged as an objection to the use of acupressure; and no doubt it is, to a certain extent, a drawback, because, however gently effected, it must in some degree interfere with the accurate apposition of the surfaces which have been approximated. Should there, however, be any object to be gained by leaving the wound completely undisturbed, this might easily enough be effected, either by leaving the needles in till the wound is healed, or by taking care that in the introduction of the needles they shall lie so completely horizontal with the opposed surfaces of the wound, and so directly in the axis of the opening in the margin through which they are to be withdrawn, as to avoid any undue disturbance in their removal. In this manner, without force, the needles will admit of extraction at any time from a few hours up to days or weeks after the operation, as may be thought most expedient.

In the amputation of the forearm (Case 3), some of the needles were taken out early, some were left untouched till the sutures were removed, and in the latter instance they seemed to create no irritation of any kind, while from the side in which they were left undisturbed there was less discharge than from the other. In all the cases a very moderate amount of attention enabled the needles to be inserted in such an axis as to lay them in a position most suitable for easy removal. Without entering upon the question as to the immediate or remote effect of torsion upon the twisted end of the smaller arteries, there can be no doubt, in the case of vessels the size of those of the forearm or leg, that if the process of torsion is to be really efficacious in arresting all further bleeding, a considerable portion of the extremity of the vessel must be so injured as to ensure its dying and separating as a slough, while in those cases of my own, and others where I have had an opportunity of dissecting the parts after the employment of the needles, no slough whatever appeared to have formed.

The effect of the ligature in producing loss of vitality of the small portion of the vessel, and other soft parts beyond the embrace of its noose is, I suppose, undeniable; and although it may be of small moment when the ligature remains in the wound till the separation of the little morsel of dead tissue is complete, and it has floated away in the discharge of matter which continues to find its way along the ligature, in the case of the twisted vessel it is far otherwise. Here the portion of vessel which had been injured by the torsion, more nearly resembles in its condition that of the noose of a ligature which has had

both ends cut off short after the deligation of the artery. In such cases, as is well known, should the wound seem to have healed kindly, a small abscess sooner or later forms in connexion with the foreign body, and, by its seeking the surface, breaks up the union which had already taken place. In considering the effects of torsion as contrasted with acupressure in small vessels, as affecting union by the first intention, we are apt, when torsion is applied, to be deceived by the fair union of the external surface of the wound, and to imagine that it is the same throughout its whole depth, and thus to conclude that the extremities of the twisted vessels have healed kindly along with the rest of the cut surface. That there may be no sloughing of the extremities of these minute vessels after torsion, I am not prepared to deny, but that it is necessarily so because the union seems so perfect externally, I am not prepared to admit. In those very cases where the union by the first intention is most readily obtained, and is most perfect in appearance upon the surface, it is so just because there is another surface of the wound in which the union is much less perfect, and from which a ready escape is afforded for blood and serum in the first instance, and for more or less suppuration afterwards. The pus, then finding its way most readily in the direction of the deepest surface, does not interfere with the accuracy of union on the cutaneous surface. If, in such cases, torsion of the bleeding vessels has been employed, and sloughing of their extremities ensues, the small fragment of detached tissue escapes inwards along with the pus, and leaves the surface unaffected. The union, then, in such cases by the first intention is rather apparent than complete. The surface aspect of the wound does so heal, the deeper portion suppurates and granulates, I will not say always, but certainly very frequently.

3. The only remaining question to be determined is the influence of acupressure on the union of wounds in the cases described. In determining this result it is essential to understand the use of terms, for many differences of opinion in the matter of union by the first intention, union by adhesion, ar primary union, are undoubtedly due to the varying significotions attached to these terms. In strict application they should be reserved for wounds which heal without the formation of a particle of pus. From what I have just said under the previous head, it is plain that such union occurs but rarely, that though a part of a wound frequently heals in this manner it is but a portion, not the whole, and that those instances which are most frequently quoted, as affording a pattern example in this way, are exactly the cases where the suppurating part of the process is least easily observed, and where the union by adhesion is most obvious. I do not quite go the length of some continental

authors who deny *in toto* the existence of union by the first intention, except to a most limited extent in most favourable circumstances, but I am inclined to believe that the entire absence of all trace of suppuration has been too readily taken for granted. In the careless and incorrect use of pathological language, which is perhaps too common with us all, cases of plastic operations upon the lips and cheeks are usually referred to as examples of the most satisfactory union we can obtain when we have adhesion without the formation of a drop of matter. But while this is undoubtedly perfectly true as regards the cutaneous aspect of such wounds, it is, I am convinced from observation, not true as regards the mucous aspect of the wound from which matter does escape, but mingling with the saliva, and being swallowed, is apt to elude our notice. In the instance of any incised wound, where there is no great tension, nothing is more easy than to obtain a similar amount of primary union, if we bring the cutaneous edges together with equal care; but here, there being no second surface corresponding to the buccal cavity in wounds of the cheek and lips from which the pus may escape unperceived, the consequence is, that it is pent up within and forms an abscess. When, then, we wish to obtain union by the first intention to as great a degree as possible, in the case of large flesh wounds or amputations, our principal object, it appears to me, should be to regard the cutaneous surface as the secondary one which should be sacrificed to the accurate adhesion of the deeper parts, so that while they heal, from it the blood and serum, and afterwards the pus—should it form—may obtain a free escape. It was with this view that in Cases 2, 3, 5, and 9, I adopted measures calculated to obtain such results. The progress in these cases was certainly to my mind, and to that of all experienced observers who saw them along with me, very different from what I had ever previously obtained; and in my description of the progress of these cases my object has been not to set them in as favourable a light as possible, but to give the facts which might be described as unfavourable as great a prominence as possible. In these cases I have no hesitation in saying that union occurred as thoroughly by the first intention as is ever seen in plastic operations upon the lips and cheeks, and certainly with an entire absence of anything that could be described as characteristic of the local or constitutional symptoms of inflammatory action. As to the other cases, where undoubtedly suppuration, occurred, and in some copiously, the result need excite no supprise, as a few words will suffice to demonstrate.

In Case 1, of hernia, the parts operated on and cut through were acutely inflamed: nothing short of suppuration could therefore have been expected.

In Case 4, of amputation at the ankle, the hollow form of

flap in this amputation does not admit of accurate apposition in any circumstances, and therefore, for that reason alone, suppuration must have taken place, but especially so in this instance was it likely to occur, where, from the extensive formation of matter in connexion with the disease of bone, a part, and that a considerable part, of the interior of the flap had already suppurated. The sloughing of a portion of the flap which ensued was where the soft parts had been undermined by the progress of the pus towards the surface during the advance of the necrosis.

In Case 6, amputation below the knee and at the ankle, suppuration occurred simply from the want of accurate apposition of the surfaces of the flaps with the parts with which they were brought in contact; this apposition being impossible from the site of amputation and the nature of the flaps. The sloughing of a portion of the flap in the amputation below the knee being manifestly due to its being involved in the original injury, although at the time of the amputation there was no symptom of any such extension of the effects of the accident as to render it justifiable to resort to amputation of the thigh rather than attempt to save the knee by operating on the leg.

In case 7, excision of the elbow-joint, that suppuration after the operation should occur where a large abscess sac already existed in connexion with the disease of the articulation, and when the patient had, for some days, tossed the limb about during convulsive and maniacal seizures, is certainly not more than might have been anticipated, and may, I think, in such circumstances, find a more easy explanation than in the fact that needles were employed to check the bleeding.

In case 8, suppuration certainly took place in a most limited area of the hiatus left by the removal of the cystic tumour of the breast, and was largely due to the want, on our part, of that accurate application of pressure to keep the flaps steadily fixed in their position upon the surface of the pectoral muscles, by which alone any hope of perfect primary union could be realized.

The sum of the whole matter, it seems to me, may be expressed in the following statements:—

1. Acupressure may be employed as a hæmostatic agency in the instance of vessels as large as the posterior tibials without risk, so far as bleeding, immediate, consecutive, or secondary is concerned.

2. Acupressure is easy of application, while its adaptation to situation and circumstances is as great, or it may even be greater than that of the ligature.

3. Acupressure is more trustworthy and satisfactory than either torsion, compression, or the use of the cautery.

4. Where primary union can take place, acupressure is likely to favour its occurrence; and, in three of the cases described, seemed of material service in this respect.

5. In the cases described, where suppuration or sloughing occurred, this was altogether independent of the use of acupressure, or the absence of the employment of the ligature, and referable to causes inherent in the individual cases.

6. In my opinion, the employment of acupressure in one or other of the methods suggested by Professor Simpson is safe, satisfactory, and well worthy of an extended trial.—*Edinburgh Medical Journal, July* 1865, *p.* 45.

43.—ON ACUPRESSURE FOR CONTROLLING HEMORRHAGE.

By Professor Rawdon Macnamara.

(Abstract of a paper read before the Surgical Society of Ireland.)

[The patient, aged 40, had suffered for several years from a chronic abscess on the outer side of the leg, which continually discharged a thick offensive matter mixed with blood. The whole leg, when he came to the Meath Hospital appeared to be one mass of disease. Numerous sinuses communicated with the carious tibia, behind which there was evidently a large abscess. The leg was removed through the condyles as recommended by Mr. Syme.]

Along with Mr. Syme's operation through the condyle, he had combined Professor Simpson's method of acupressure, which was an interesting circumstance in the present aspect of affairs. He found not the slightest difficulty in controlling the hemorrhage. The popliteal artery, the principal vessel to be secured, was of unusually large diameter. It was as large as the femoral artery. It was at once and most effectually controlled by the form of acupressure which he brought before the Society that day month, and which is known as the third method—recommended by Dr. Simpson—that is inserting the needle under the vessel, and then putting a loop of wire across it and turning it under the needle. It at once and in the most satisfactory manner controlled the popliteal artery. Four other vessels required acupressure, and scarcely any blood was lost. The operation was performed on Friday, and on the following Monday he would have removed the needles could he have done so that day in the presence of the students. Indeed he might have removed them safely on Sunday, but that being a *dies non* so far as the pupils were concerned, he delayed doing so until Tuesday, when, in the presence of the class and of his colleagues, he removed the needles, and there was not the slightest discharge of blood, nor had there been the slightest ap-

pearance of hemorrhage from that period to the present. He saw the man at two o'clock that day, and everything looked most promising for his recovery. He might be asked what did he gain by acupressure in these cases? He was not putting himself forward as an advocate for acupressure; his experience had been too limited on the subject to permit him to do so, and he was merely bringing before the Society the cases in which he had employed that method of controlling hemorrhage. That night fortnight he brought forward a case where he had removed a woman's breast. He stated that two hours after the operation he removed the three needles which he had used, and that two of the vessels were as perfectly sealed as ever vessels were, and the third vessel spouted in his face. He reapplied the acupressure, and in a couple of days afterwards he removed the third needle without the loss of a drop of blood. What did he gain in that case? All he could state was this, that the whole wound united by the first intention. It appeared to him that his patient would have gone back to Clare, from whence she came, within a week, but unfortunately she accidentally caught erysipelas from another patient, and the lower and upper portions of the incision suppurated slightly; the intermediate portion, however, remained firm. The whole breast had gone on most satisfactorily, and the patient had returned to the country within one month, the breast perfectly united. When he brought this case before the Society on a former occasion, he was asked why he did not remove the glands in the axilla, and he replied that he did not remove them because it was so decided on consultation, the opinion being entertained that they might have been enlarged from simple irritation and not from malignant action. The diagnosis and prognosis regarding the glands were borne out by the fact, that the woman had gone down to Clare without any enlarged glands in the axilla. In Donohoe's case, what did he gain by the adoption of acupressure? In an assemblage of surgeons he need not enter into a detail of this operation, and he would only say that a considerable part of the wound united by first intention. Where tendinous structure existed there was some sloughing, but he was so perfectly convinced of the merits of acupressure that he intended to employ it in two amputations which he anticipated having to perform next week. In a recent case of extirpation of the testicle Mr. Porter had used acupressure. He drew the ligature round the cord on Simpson's method, and not a drop of blood was lost. One of the arguments used against acupressure was, that pressure on nerves would be attended with pain; yet this man had acupressure applied to the cord, and the whole of the hemorrhage arrested by that means, and he did not require any sedative after the operation.

He complained of nothing to interfere with his comforts to any extent. He saw Mr. Porter withdraw the needle from the cord, and not a single drop of blood followed. He happened to be in Edinburgh some time ago, and was entertained at Professor Simpson's hospitable table. The Professor showed him on that occasion a nice model which he had made to explain the system of acupressure. He (Mr. Macnamara) said to him—"There is no doubt you have carried out acupressure in a most practical manner, but allow me to tell you that that is simply the treatment of aneurism by compression, which originated in the City of Dublin." He referred Dr. Simpson to the "Medico-Chirurgical Proceedings," vol. xlii., in which would be found a paper on the subject by his distinguished master, Sir Philip Crampton. This was published in 1816, and it appeared that Sir Philip Crampton led the way for acupressure. He remembered when it was said that it was necessary for securing a vessel that the internal and middle coats should be divided by the ligature. He was addressing gentlemen who had been taught that, and who had taught it themselves to others; and yet so early as the year 1816 Sir Philip Crampton stated that it was perfectly unnecessary for the middle and internal coats to be divided; all that was required was to bring the walls of the vessels together, and adhesion would most probably be the result. He remembered distinctly going round the wards of the Meath Hospital with the late Surgeon Porter—a man whose name must always be mentioned with reverence in that place for his eminent services to surgery—and he had often heard him say, "Ah, that nasty ligature—what is it doing here?" He remembered being horrified at the manner in which Surgeon Porter would pull at the ligature, and yet he never saw a drop of blood follow its removal. Here was another man, distinguished for his services in respect to aneurism and surgery generally, who seemed to be on the right road to acupressure, and no doubt Sir Philip Crampton, who taught Mr. Porter, and Mr. Porter also, had laid the foundation for acupressure as a mode of controlling hemorrhage. He thought acupressure was so important a branch of the profession, and was likely so completely to revolutionize surgical manipulation, that every surgeon ought to bring forward the cases which had fallen into his hands—well if fortunate, more important still if unfortunate. If any unfortunate instance occurred in his practice he would not be less quick in bringing it forward than he had been with respect to the cases he had already brought under their notice. He thought acupressure deserved to be taken up by the Dublin surgeons, and subjected to the *experimentum crucis*. If it did one half of what Professor Simpson claimed for it, a great boon would be conferred on

medical science. That could only be ascertained by testing it. They knew how the treatment of aneurism by compression was pooh-poohed on the other side of the water. Let them not follow a bad example and pooh-pooh acupressure, which, I repeat, if it did only one half of what Dr. Simpson said it would effect, would be a great boon to operative surgery. —*Dublin Medical Press, June* 7, 1865, *p.* 533.

ORGANS OF CIRCULATION.

44.—ANUERISM OF THE POPLITEAL ARTERY CURED BY DIGITAL PRESSURE IN TWENTY-SIX HOURS AND FORTY-FIVE MINUTES.

By Dr. George H. Porter, Senior-Surgeon to the Meath Hospital and County of Dublin Infirmary, &c.

[The patient was 26 years of age. He had a pulsating tumour, the size of a small hen egg, in the right popliteal space.]

Considering this a very suitable case to try digital pressure, I commenced it on the morning of the 19th April, at 11 o'clock, a.m., a number of the pupils of the hospital kindly volunteering their assistance, and each gentleman becoming responsible for two hours' pressure at a time, up to 9 o'clock, p.m. Having applied a flannel roller from the foot to the knee, and shown the pupils how to make pressure by placing the points of the middle and index fingers of the left hand over the femoral artery where it crosses the brim of the pelvis, then to fix and increase the pressure by placing the middle and ring fingers of the right hand on those already over the vessel, I desired that the pulsation in the tumour should be arrested as much as possible. I also taught the patient himself to press the vessel, and throughout the treatment of the case he occasionally gave assistance to the young gentlemen in charge. I visited him at 2 o'clock, p.m., April the 19th, and learned that the compression had been carefully sustained, and was well borne by the patient. The tumour was certainly more solid than before, but the pulsation remained undiminished whilst the leg and foot affected were warmer than the other. Again, at 5 o'clock, p.m., of the same day I saw him. The solidity of the aneurism had by this time evidently increased ; but as yet no apparent change had taken place in the force of pulsation. 9 o'clock, p.m. The tumour now was much more solid. The pressure was then discontinued for the night, and thirty drops of Battley's sedative liquor of opium administered in a draught.

April 20th, 9·30 o'clock, a.m. The man had passed a tolerably good night ; awoke once about midnight with a sharp pain in

the tumour. This was the first time he had ever felt pain in the aneurism, but it did not last more than half an hour, when he fell asleep. Compression was resumed this day, by gentlemen who came forward to offer their assistance, as others had done on the day before. 12 o'clock, p.m. The tumour now was very solid, and the pulsation was greatly diminished. 1·45 o'clock, p.m. Pulsation had now ceased completely, and the sac was firm, and solid. The patient complained of slight numbness along the back, and outside of his leg, but there was no œdema whatever in leg or foot. The pressure was continued in a slight degree up to 7 o'clock that evening, when it was finally discontinued. The beating of the femoral artery could be traced down at this period to about four inches from the knee. He got the opiate, as before, at 9 o'clock, p.m.

April 21st. He had passed an excellent night; no pain or swelling in the limb. The superior internal articular artery was evidently enlarged, and pulsating strongly. I kept him in bed for a fortnight from this date, with the limb rolled in flannel, and the tumour gently rubbed, every night, with a liniment, consisting of 2 oz. of soap liniment and 15 grains of iodide of potassium. He was then allowed to get up, and move about the ward on crutches.

May 29th. I tapped his hydrocele; and on the 3rd of June he was discharged the Hospital.

Thus, in the short time mentioned, the formidable disease was perfectly cured by finger pressure. The point where the fingers rested was only slightly reddened, but did not become sore throughout the treatment; and he never complained that the pressure gave him pain. This contrasts strongly with instrumental arrest of the flow of blood through an aneurism; for no matter how carefully applied, it cannot be borne so long as can the finger top; and further, the artery cannot be isolated so completely from its accompanying vein by mechanical as by digital compression, and therefore, œdema of the limb is more likely to ensue. There is less likelihood of ulceration, or sloughing of the skin occurring under the point of pressure than when an instrument is used, inasmuch as by being so direct, a smaller amount of force suffices to control the current of blood through the artery; and, as the point of pressure can with such ease be changed to a higher or lower position. But in addition to all this, the rapidity of the cure in cases of digital treatment contrasts most favourably with any mechanical pressure, as in one case a few hours usually accomplish what in the latter requires days. With respect to the rapidity of cure in cases of aneurism treated by compression of any kind, I cannot more appropriately conclude this account of mine, than by citing some remarks of my esteemed friend and very accomplished surgeon, Mr.

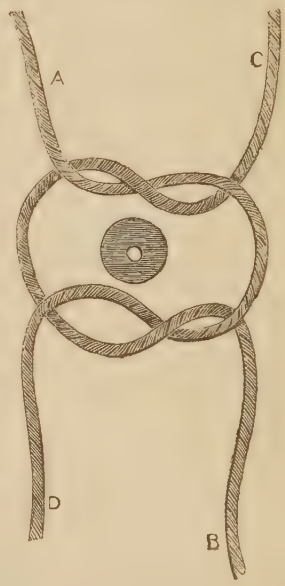
L'Estrange, at a recent meeting of the Surgical Society of Ireland. They struck me forcibly at the time, and are well worth the attentive consideration of every practical surgeon. I quote from the Dublin Medical Press, June 7th, 1865, p. 536. He said :—"I would wish to observe that it appears to me that there must be some peculiar state of the blood, which admits of quicker coagulation in some individuals than in others, placed under similar circumstances and under similar treatment. For instance, we have had in this city, within this last few months, three cases of aneurism treated by external compression. In one, cure by coagulation of the contents of the sac was effected in the short space of five hours and three-quarters (Dr. Mapother) ; the second was effected in twenty-five hours and a-half (Mr. Porter)—(here he slightly erred); and in the third, coagulation could not be effected although the external compression was steadily kept up, and well borne by the patient for many weeks. It would be of great importance to ascertain this physiological and pathological fact, as to the coagulation of the blood in the aneurismal sac under compression. This I should think might be ascertained, or great light thrown on the subject, by taking a small quantity of blood from each of these patients—Dr. Mapother's, Mr. Porter's, and the one in the City of Dublin Hospital—in which coagulation would not take place by external compression; and by submitting their blood to chemical and microscopical tests, much information might be obtained, which would conduce materially to the scientific treatment of aneurism." —*Dublin Quarterly Journal, Aug.* 1865, *p.* 11.

46.—ON A NEW MODE OF TYING ARTERIES, ETC.

By Frederick Churchill, Esq.

The very rapid success which has attended the introduction of acupressure as a hæmostatic agent in surgical operations, and its speedy adoption by many of our most distinguished surgeons, is sufficient proof that the ligature, though employed with such success for a number of years, is not the best mode of arresting arterial hemorrhage. Still the very fact that the advocates of acupressure have hitherto failed to produce a single valid argument to prove the advantages of acupressure over those of the ligature, except as a temporary compressor of the bleeding point, is sufficient to induce us to give further consideration to the claims of the latter. With this view I began to consider how we might combine the advantages of each, avoiding all the disadvantages, or, in other words, to secure the artery against the risks of secondary hemorrhage by a ligature removable at will. The result of my investiga-

tion is the knot I am about to describe. Take two ligatures of the ordinary length, and tie upon them a reef-knot. This may be either prepared beforehand, and kept slack, so as to be slipped over the head of the forceps when the artery is seized, or, with the help of an assistant, it may be easily tied at the time of the operation. The form of knot may be better understood by referring to the woodcut. In the centre of it is a transverse section of the gutta-percha tube described below. When the knot is made fast, cut close either A and B or C and D, the remaining ends being arranged on each side of the flap. Where several ligatures are employed, it is advisable to tie the corresponding ends over the face of the stump. When the artery is occluded, which, I believe, will prove to be in a much shorter time than with acupressure, a gentle and equable pull of the corresponding ends in a straight line will untie the knot. The fact that the middle coats when divided will retract, renders it certain that the risks of secondary hemorrhage are less than when the needle is used, and, consequently, an earlier removal of the ligature can be effected with safety.



Should the objection be raised that "in sponging the flap you may untie the knot,"—I have found by experiment that it holds as firm as the old ligature, except when counter-traction is made upon the corresponding cords, which never would be the case when sponging; or that "in removing the knot you disturb the artery,"—I maintain, on the contrary, that the removal of the knot *may* tend to occlude the artery more effectually, by twisting it upon itself, and cause the formation of an external clot within the sheath to support the internal coagulum. In order to test the resisting power of the knot to the current of blood in the artery, I made a number of experiments which prove that the single reef is quite sufficient to hold any artery. For instance, I took a piece of thick elastic tubing about three inches long, to one end of which I astened my knot, and into the other end I inserted the

nozzle of a very powerful syringe, the piston-rod being an inch in diameter. I then handed it to a sceptical friend, who injected water into the tube, but with all his force he failed to dilate the knot. This he acknowledged quite convinced him. Still, in order to combat, if possible, all the objections that may be raised, I experimented with the double reef—i.e., a reef-knot on either side of the artery, which has of course double the strength of the old ligature; and I removed this also with comparative ease, though not quite so readily as the single reef.

I am therefore sanguine that, should my future experiments on living animals confirm those I have already made, my plan will become generally adopted. With these few remarks, I beg to leave the suggestion in the hands of the profession, who I have no doubt will give it an unbiassed reception, if it prove worthy of recognition at all.—*Lancet, Nov.* 4, 1865, *p.* 510.

ALIMENTARY CANAL.

46.—ON THE RADICAL CURE OF INGUINAL HERNIA.

By Dr. J. Fayrer, Surgeon, Medical College Hospital, Calcutta.

The following method of operating for the cure of inguinal hernia I have found to be more simple and successful than that I had previously practised. It has, so far, been unattended with any dangerous consequences, and, though it has failed in some cases to give complete relief, it has improved the patient's condition by enabling him to control the hernia more thoroughly by aid of a truss. It appears to have the advantage of not confining the patient very long to his bed, the treatment seldom extending beyond five or six weeks, and the latter part of that not necessarily requiring confinement. The only disagreeable results that I have yet observed, and that only in one or two cases, was suppuration extending towards the thorax, between the abdominal muscles, giving rise to irritative fever and exhausting discharges; but this has not endangered life, and has quickly subsided on free counter incisions being made to give exit to the pus.

Sloughing of the integument at the seat of operation rarely occurs, beyond the death of a minute portion of it just where the needle emerged and the ligatures are tied; and in no case have I seen peritonitis to a dangerous extent take place; nor has hemorrrhage occurred, though it is difficult to understand how the epigastric artery always escapes.

The object of the operation is, as in the other methods, to invaginate a portion of the scrotum within the inguinal canal

and secure it there. But I must state my impression that the success of the operation does not depend so much on retention of the invaginated scrotum within the canal as on the formation there of a quantity of exudation and cicatrix tissue. I have frequently remarked that the success of the case did not depend on the invagination remaining in the canal, for I have seen successful results when the invagination had completely descended, and I have also not unfrequently seen the converse of this.

My impression of the operation is, that it is very often successful, but frequently unsuccessful, and that we are not able to speak so positively as to the result as we are in other operations, so much depending on the accident of how the exudation may be poured out, and in what direction, and how the cicatrix will form.

The chief element of success appears to me to consist in the careful introduction of the plug into the canal, that the end of it may press well against the internal abdominal ring. Much, also, depends on the subsequent dressing, and care on the part of the patient, not by any premature effort or over-exertion to force down the protrusion whilst the process of cicatrisation is yet incomplete.

The instruments with which I operate are very simple,—two plugs of wood, silk ligatures, and a curved needle; one plug of wood about six inches long, rounded and compressed at the end and lengthways, and about the circumference of a man's thumb. This may be made of wood, ivory, or bone. Any wood will do, though, perhaps, ebony is the best. At one end it is pierced obliquely, and threaded with two strong ligatures made of the strongest ligature silk. These, before being used, should be waxed. A needle, made of strong steel, curved and inserted into a firm handle, with an eye at the point, through which the ligatures in the plug have to be passed. The curve of the needle amounts to about half a circle. In addition to these, a small blade or plug of hard wood or ivory about an inch and a half long, three-quarters of an inch in diameter, and rounded, is required to tie the ligatures firmly over when the plug has been inserted into the inguinal canal.

The mode of operating is as follows:—The patient is prepared by having the bowels opened the night before. The pubes and scrotum are shaved and the bladder emptied just before the operation, which may be performed under chloroform if the patient dreads the pain. The forefinger of the left hand is then introduced within the external abdominal ring, pushing before it an invagination of the scrotum. Having introduced it as far into the canal as possible, the needle is

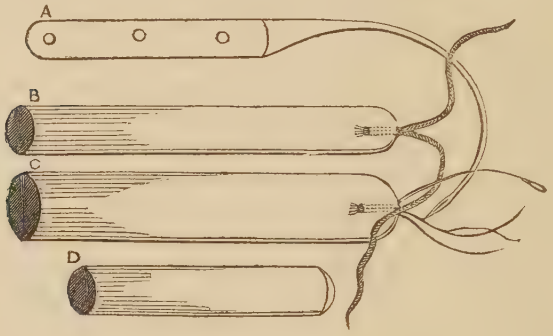
threaded with one of the silk ligatures, and being held in the operator's right hand is gradually insinuated along the palmar aspect of the left forefinger until it reaches the extremity of the invagination ; it is then thrust boldly through the tissues lying over the finger, and emerges about one and a-half inches interiorly to the anterior superior spine of the ilium. The needle is then unthreaded and withdrawn. Again threaded with the second ligature, the process is repeated, taking care to pass the needle through the tissues, not quite at the same point in the canal as the first, but bringing the ligatures out at the same aperture in the integument. This is easily effected by drawing the yielding integument over the point of the needle until it merges at the original point of exit. The needle is again withdrawn, and now the plug is insinuated into the canal whence the finger has just been withdrawn, and is tied tightly in the canal by the two ligatures being firmly knotted over the small piece of wood provided for the purpose. The plug, it is to be observed, should be well oiled, and introduced as the finger is withdrawn. Until recently I was in the habit of using various sized plugs, fitted to the size of the abdominal ring in each particular case ; but I now find that to be unnecessary, and use only one size of plug. Its object is to support the invagination at the upper extremity of the inguinal canal, and not to exert any lateral pressure. It is to be understood, however, that the canal is to be sufficiently occluded to prevent any descent of the hernia by the side of the plug.

The subsequent treatment is equally simple. When free suppuration makes its appearance either by the side of the plug or round the ligatures, the plug should be withdrawn. The invagination is then supported by a pad, after sponging away the discharge and dressing the wound with simple dressing, and a spine bandage. The patient should be kept carefully in the recumbent posture. The bowels seldom act for several days after the operation, but the patient should be warned against straining if they should do so. An opiate is desirable after the operation to tranquillise the patient, and also to prevent any tendency in the bowels to act. It frequently happens that there is retention of urine. This is relieved by fomentation, or, if necessary, by the catheter. Abdominal tenderness requires hot fomentations ; and if any indication of peritonitis present itself, frequent and full doses of opium will be needed, but this in my experience is very rare.

In ordinary cases the wounds, scrotal and abdominal, heal rapidly, and all that is needed is careful dressing to prevent descent of the hernia. The patient should not walk until the wounds have healed, and then only with a well-fitting pad and bandage.. When the wounds have thoroughly healed, the

patient may take exercise with a well-fitting truss, which should not be left off for three or four months, when cicatrisation may be presumed to be completed.

These are the instruments with which I operate. The plugs are made either of ebony or teak wood. B is the plug in ordinary use; C is used in some of the larger cases of scrotal hernia, where the abdominal ring is very large.



A.—Needle.
B.—Ordinary plug.
C.—Larger plug for large herniæ.
D.—Block to tie the ligatures over.

—*Med. Times and Gazette, August* 19, 1865, *p.* 193.

47.—ON THE COMPLICATIONS OF INTERNAL HEMORRHOIDS AND THEIR TREATMENT.

By W. Allingham, Esq., Surgeon to the Great Northern Hospital, &c.

[The treatment of hemorrhoids followed by Mr. Henry Smith, viz., the clamp, excision, and the actual cautery, are now well known, and do not require review to render the following intelligible.]

Let us examine for a moment Mr. Smith's statement as to the superiority of the cautery over the ligature. He says:—"It is not possible that tetanus or pyæmia, the two most formidable results of the ligature, can occur after this operation." Allow me to observe that on this point Mr. Smith gives very little evidence; the few cases operated by him and others can form no satisfactory standard of comparison with the results of the ligature.

From 1763 operations upon hemorrhoids with the ligature performed at St. Mark's Hospital, five cases of tetanus resulted. It is remarkable that four of these occurred in the spring of 1858 (two in March and two in April), a year in which I find tetanus was very much more frequent than usual in other hospitals. From 1858 to the present time there has been no case of tetanus, and rather over 800 operations for hemorrhoids have been performed. Although Mr. Smith asserts that it is not possible for tetanus to follow his operation, I cannot myself see why it should not; in fact, I think most surgeons would bear me out that a burn has been a frequent cause of tetanus. In the year 1857 I removed a very vascular tumour from the entrance of the vagina of a young woman. The hemorrhage was arrested by the actual cautery: no ligature was used; tetanus supervened in five days.

With regard to pyæmia resulting from the ligaturing of hemorrhoids, I will again refer to the statistics of St. Mark's Hospital, which show that no case of pyæmia after the operation has ever occurred in that institution.

And now as to the final advantage claimed by Mr. Smith—viz., "That patients are not half the time in bed, and the convalescence is much more rapid."

This, I am willing to admit, would be a great superiority over the ligature if it could be safely guaranteed; but it is in this particular that I have been most disappointed, for in none of the twelve cases I have operated upon with the clamp and cautery was the convalescence materially shortened.

After the ligature, I keep my patients lying down until it separates, which usually takes place on the sixth or seventh day. They then get up; but I interdict any active exertion, and recommend the recumbent posture for a few days longer, or until the wounds are nearly healed. I am quite aware that patients might get about much earlier, but I think there would be danger in doing so; and I should anticipate as the probable result chronic ulceration, possibly ending in more or less stricture. I operated some time ago upon a gentleman who had bad hemorrhoids, to which I applied five ligatures, and, through an unexpected turn of business, he was obliged to get up on the fourth day after the operation and go to town, where he remained standing and sitting for some hours (as he assured me) with less discomfort than he had frequently experienced before the operation. The case did none the worse for it, but I thought it a very dangerous experiment, which I should not advise any one to repeat.

Now let me ask, what is the condition of the rectum of patients operated upon by the clamp and cautery at the end of five or six days? From a careful examination of my patients,

both by the finger and the speculum, I can assert that they have more or less extensive wounds where the piles have been excised and the slough produced by the cautery has separated. I do not for one moment doubt that they could resume their usual avocations, but I submit that it would not be sound surgery to allow them to do so. Active exertion and the erect posture maintained for any length of time so soon after the operation is very inimical to cicatrization, for the veins of the rectum in these cases are dilated, and, moreover, they are destitute of valves, so that the sore much resembles that condition called varicose, and, therefore, I believe the recumbent position is most advantageous. This point I have frequently seen exemplified in simple ulcer of the rectum, which has resisted all kinds of treatment as long as the patient went about, but has rapidly healed with a little opiate injection when the horizontal position has been maintained for a week or two.

I cannot help believing that if this attempt to save time after the operation by excision and the cautery be persevered in, it will prove disastrous to many patients. One of my cases after that operation got about on the fourth day, and then for three consecutive days lost as much as a quarter of a pint of arterial blood on going to stool, and this was checked by confining him to his bed again for a week.

In cases of hemorrhoids complicated by fistula the sinus should be laid open, and at the same operation the hemorrhoids ligatured. Even if the fistula be a very severe one, I should prefer doing the operation all at once. Of course, the time of recovery is delayed, but in this respect also a saving is effected in the end. If the fistula be divided and the hemorrhoids left to a future operation, they come down more, and are a constant source of annoyance to the patient and irritation to the wound, which may thus be prevented from healing.

I saw a case of this kind some time ago, in which the fistula remained unhealed four months after the operation. I think in these difficult cases it is advisable, not only to slit up the sinus, but to make a tolerably free incision through the floor of it, so as to divide any fibres of the sphincter that may be beneath the fistula, as well as the indurated tissues which usually form its base. The incision, also, should, I am of opinion, be carried beyond the external orifice of the fistula into the healthy tissues, by which means you may avoid a collection of matter, which burrows under the integument, and gives trouble, and possibly may necessitate another incision.

I must here enter a protest against too much dressing and the use of ointments in these cases; a little dry cotton wool inserted gently between the edges of the wound is all that is required. I am sure I have many times seen fistulæ remain

unhealed in consequence of the interference of the surgeon, who had daily put lint smeared with a stimulating ointment to the bottom of the wound. In cases where severe ulceration and stricture co-exists with hemorrhoids, only palliative measures can be adopted. The use of sedative injections, the occasional introduction of a bougie, rest in the horizontal position, and a careful regulation of the bowels may do an immense deal, in some cases even effect a cure; but, failing that, the patient may be made very comfortable, and life, which was previously a burden, be rendered quite endurable. Any operation upon the piles must, as in the case I related in my last paper, only aggravate the already deplorable condition of the patient.—*Medical Times and Gazette, Sept.* 2, 1865, *p.* 250.

48.—ON THE ALLEGED DANGERS OF THE LIGATURE IN THE OPERATION FOR HEMORRHOIDS; AND THE COMPARATIVE MERITS OF THE TREATMENT BY THE CLAMP AND BY THE LIGATURE.

By James R. Lane, Esq., Surgeon to St. Mary's and the Lock Hospitals, and to St. Mark's Hospital for Diseases of the Rectum.

There is perhaps no operation in the whole range of surgery which affords so much relief at so small a cost of suffering and risk as the removal of hemorrhoidal tumours by the well-known and long-established operation with the ligature. Nevertheless there appears still to be, on the part of the public, and even of many members of the medical profession, a sort of undefined dread of ill consequences arising from it; the result of which is, that many persons are induced to linger on for years in misery and discomfort, when surgery is capable of affording them complete and permanent relief, at a risk scarcely greater than they are constantly incurring in the ordinary affairs of life.

A good illustration of what I state has been recently afforded me in the case of a young officer, who had spent some years in India, and who was suffering from the disease in its most aggravated form. It completely incapacitated him for his duties, and compelled him to return to this country for treatment. When I saw him he had been here more than a year, but had had nothing done, because he had been told by a physician of eminence, whom he consulted, that it would cost him him his life if he allowed himself to be meddled with. He was otherwise in fair health, and I could discover nothing in his case to contra-indicate an operation. I therefore persuaded him to submit, and the consequence was that he recovered

without any untoward symptom, and was quite well at the end of a fortnight.

I have no doubt that to the existence of this vague impression might be traced the introduction of nitric acid in the treatment of this disease; and now, since experience has shown this remedy to be quite inadequate to the cure of the complaint in its severer forms, and only applicable to a small and exceptional class of cases, I believe we owe to a similar cause the introduction of a new operation with a clamp and the actual cautery. This method has been persistently vaunted during the last two or three years, as affording a certain means of cure combined with a complete immunity from all those indefinite ills to which the ligature has been stated to give rise. I have no wish to depreciate this new operation, which is ingenious enough, and may, I doubt not, be found effectual, though I do not believe it to be better, and there is not a shadow of proof that it is safer, than the methods previously in use. I cannot, however, refrain from expressing my opinion that its author, Mr. H. Smith, has exceeded the limits even of parental partiality, in the way in which he has attempted to build up its reputation at the expense of the fair fame of our old and tried friend, the ligature.

The operation to which I allude is performed in this wise. The hemorrhoidal tumours being protruded, they are seized and their bases firmly compressed with the clamp. They are then cut off, and, to prevent bleeding, the cut surface is cauterized, either with nitric acid or the hot iron, the latter having been found the more effectual. The clamp is then removed, and the cut surface, covered of course by the layer of slough produced by the cautery, is allowed to recede into its place within the rectum. Any external piles which may happen to be present are then cut away with the knife or scissors.

What is the *real* state of the case as regards the consequences of the operation with the ligature, deducible from the experience of those who have had the largest opportunities of forming a judgment on such a matter? The following quotation from the writings of Sir B. Brodie must commend itself to everyone by its plain common sense and sound judgment. He says:—"I conceive this is not only one of the most effectual, but one of the safest operations in surgery. I should think I must have performed or seen it performed between 200 and 300 times. I saw one patient who died after the operation, in consequence of diffuse inflammation of the cellular membrane running up the inside of the gut as high as the mesentery; but that was a patient whose constitution was broken down by long-continued hemorrhage, and in whom any slight accident might have pro-

duced equally bad consequences. I saw another patient who, a week after the operation, and having been quite well in the interval, had an attack of pain in the abdomen and shivering, attended with fever, and died..... With the exception of these two cases, I never knew any ill consequences arise. I contend therefore that the operation is as safe as any operation can be expected to be. You are not to suppose that even the slightest operations in surgery are absolutely in all cases free from every particle of danger, any more than the slightest accident. I have known two patients die after the extraction of a tooth, and I have known several die in consequence of venesection of the arm, or an accidental prick of the finger. The chance of danger from this operation is at any rate so trifling that you need not calculate upon it. If you were to calculate upon so small a chance as this, you would scarcely be able to do anything in the ordinary affairs of life." Again, what is the opinion of the leading surgeon of the northern capital, who is well known to have had for many years a most extensive practical experience in such cases. Mr. Syme says: "I feel warranted, after very extensive employment of the ligature, to state that it may be used without the slightest risk of any serious inconvenience. Indeed, in the whole course of my practice I never met with a case which terminated fatally, or threatened to do so, when the ligature simply was employed."

My own experience of the operation with the ligature amounts now to as many as 427 cases. In the immense majority the progress towards recovery has been singularly uniform. It has been rare indeed that I have met with any untoward symptoms, or that the healing has been much delayed; and I have never seen any cause for serious alarm, except in two cases, which occurred more than seven years ago, and which have already been made public. The two cases to which I allude proved fatal from tetanus. They were lodged in the same ward, and were seized with tetanus on the same day, at a time when that complaint was epidemic in the hospitals of London to a remarkable, and I believe almost an unprecedented, extent. Out of the whole number of 427 cases which I have treated I have never seen an instance of pyæmia, of erysipelas, or of diffuse inflammation. Mr. Gowland, my colleague at St. Mark's Hospital, must have operated on as nearly as possible the same number, his appointment to that institution having been made at the same time as my own, and I know that his experience is almost identical with mine on this question. He has never met with a case of pyæmia, and has had no fatal result, excepting strange to say, two cases of tetanus, which occurred within a short time of those to which I have already referred, and were fairly attributable to the influence of the same epidemic.

Tetanus and pyæmia, as we have seen, are alleged to be "the two most formidable results of the operation with the ligature." With respect to tetanus, there is no doubt it will occasionally follow this, as it will also occasionally follow every conceivable surgical proceeding. By careful search in the medical journals it would not be difficult to find cases in support of such an allegation against almost every operation in surgery, whether small or great. But I contend that there is no evidence that the ligature of hemorrhoids has any special liability to produce this disease, and that there is no ground whatever for the statement that the inclusion of tissues in a ligature is a more probable exciting cause than the cauterization of the same tissues with the hot iron. In point of fact, burns have long been rather unfavourably known for their tendency to be followed by tetanus; therefore, in contrasting the cautery with the ligature, the inference to be drawn is certainly not to the disadvantage of the latter. The assertion that it is *not possible* for tetanus to follow the operation with the clamp and cautery is too absurd to require refutation, and equally so is the argument that an operation is exempt from an exceptional complication like this because twenty, fifty, or even a hundred cases have not furnished an example of it.

Again, with respect to pyæmia, it is to be feared that this is an occurrence from which no surgical operation will ever be able to claim complete exemption, especially in large hospitals. But all our knowledge on the subject tends to show that it depends on the health and condition of the individual patient, and on his atmospheric and other surroundings, rather than on the nature of the operation. It will be time enough to argue against the singular theory, that a slough produced by ligature and a slough produced by cautery are materially different in their predisposing influence, when any reliable facts are adduced in its support.

But I am in a position to assert confidently, and on positive grounds, that the operation with the ligature does *not* possess any peculiar liability to pyæmic infection. On the contrary, the reverse according to my experience has been remarkably the case, so much so that I have long been surprised at the exemption. I have the authentic testimony of 427 cases occurring in my own practice, and reliable information of about an equal number in the practice of my colleague, thus making a total of about 850, and out of this large number not a single instance of pyæmia has been observed.

Having now shown, I trust conclusively, that there is no ground, either in reason or fact, for the assertions which have been made in favour of the clamp at the expense of the ligature, as regards immediate danger to life, I would ask to be permitted

to examine some of the other grounds on which it has been pressed into public notice. We are told by the author of the operation (see the Lancet, Aug. 19, 1865, p. 215) "that it is not only on account of its far greater safety that he practises and strongly recommends the employment of his clamp in cases of internal hemorrhoids and prolapse, but he adopts it for the additional and important reason, that the period of convalescence after this operation is rendered so brief that the patients are enabled to be up and about their business *in one third of the time* which is of necessity consumed after the ordinary operation with the ligature." The majority of the patients are stated to have been "moving about" in four or five days, though in some it is admitted that the convalescence was protracted over a period of a fortnight or three weeks.

I am unable to speak from direct personal experience of the comparative merits of the two operations. I have not yet employed the clamp, in consequence of a scepticism, for which I trust I shall be pardoned, with regard to its alleged extraordinary merits, and also because it appears to me to possess the disadvantage of being more painful and protracted at the time, and of being, in severe cases, by no means certainly free from a liability to hemorrhage subsequently. This liability, indeed, is evident from Mr. Smith's account of his own cases. I have however, had the advantage of repeatedly seeing it performed by my colleague, Mr. Gowlland, who has used it in I believe about twenty cases. Having witnessed most of that gentleman's operations, I can testify to the careful and complete manner in which every detail was carried out. I have seen most of these cases after the operation, I have made particular inquiry respecting their progress, and I have found that there has not been, as a rule, less pain than after the other operation, nor has the convalescence been in any degree accelerated. They have not been considered fit to be discharged from the hospital in a less time than the average of other cases. My colleague, Mr. Allingham, informs me that he has operated with the clamp and cautery on fourteen cases, and he has arrived at precisely similar conclusions. I therefore take the liberty of demurring to the statement that the recovery will be complete in one-third of the time, and that patients will, as a rule, be able to go about their business in four or five days.

But I must also demur to that statement for the following additional reasons:—In the great majority of cases requiring operation there is more or less redundancy of the outer skin, "external piles," requiring removal. These must be cut away with the knife or scissors, whichever operation is adopted; and the sores resulting from their removal will render the majority of patients extremely averse from "moving about" more than

they can possibly help, at the end of four or five days. But where the outer skin is not inflamed or redundant, and does not require to be interfered with, but the disease is altogether internal, and the parts admit of being restored to their natural position within the sphincter as soon as the operation is concluded,—in such cases, I contend, the patient will be quite as well able to "move about" after the one operation as after the other. Whether it is prudent to allow him to move about is another question. I am strongly of opinion that it is not; indeed in private practice I not unfrequently find it necessary to repress the tendency to do so, because I believe that where there are large sloughing sores in the interior of the rectum (whether produced by ligature or cautery it cannot matter one straw) it is of the first importance that rest and the recumbent position should be observed, at all events until healthy granulation has commenced. If this salutary rule is largely departed from, I venture to predict that untoward results will soon become more frequent, whether the operation be performed by the clamp or by the ligature.

But it has been also alleged as an argument against the ligature and in favour of the clamp, that sometimes "the wounds resulting from the separation of the ligatures would not heal up for a long period, and the patient would be subjected to much painful suffering, necessitation, perhaps, some other operation." According to my experience cases of this kind are very uncommon, though I admit, of course, that they may occur; indeed, after an operation, out of a large number of cases, delay and obstinacy in the healing process must always be occasionally met with; but I would ask, on what conceivable surgical principle should such a result not be equally likely to follow the operation with the clamp and cautery. Wounds made with the cautery, on the outside of the body at all events, have never been noted for any peculiar rapidity in cicatrization.

I repeat that I have no desire to depreciate the operation with the clamp. I believe it to be a sufficiently effectual method of removing the disease, but I consider it to be in many respects inferior, and in no respect to have the advantage over, the operation with the ligature. It is, in truth, only another mode, but a less certain and complete mode, of doing the same thing. I admit, however, that it is an immense step in advance over the treatment by nitric acid, with which the name of its author was some years since so much identified. I should never have thought of saying a word on the subject had the new operation been left to stand upon its own merits, and had not comparisons, which I consider to be unjustifiable and unfair, been made between the two operations. I should be delighted to welcome any *real* improvement in the treatment of this disease, but I

cannot admit that this is likely to be effected by the clamp. On the other hand, I consider that the operation with the ligature has done incalculable service to humanity, and my belief is that it will continue to do so long after the clamp, like many other ingenious novelties, has been laid aside and forgotten.

In conclusion, I would add a few words respecting the best mode of operating with the ligature. The plan which I invariably adopt is that invented by Mr. Salmon, which is in my opinion, far superior to any other. By means of it most of the objections which can fairly be urged against the ligature are obviated. The hemorrhoidal tumours being protruded, they are seized in succession with a hook or vulsellum, and are separated with the scissors from the subjacent parts along the line of union between skin and mucous membrane. The cut made with the scissors should be sufficiently deep and free to detach the tumour from the muscular tissue on which it rests to an extent equal to about three-fourths of its base, leaving it attached by its upper fourth only. The ligature is placed in the deep groove thus made, and is tied tightly round the upper attached part. The danger of hemorrhage is securely provided against, because the vessels which supply the tumour do not enter it indiscriminately at its base, but descend from above beneath the mucous membrane, and their trunks are therefore necessarily included in the ligature. When the ligatures have been tied, the bulk of the tumours may be cut away, care being taken to leave sufficient tissue beyond the ligature to prevent it from slipping, and the parts may then be returned within the sphincter. Any redundancy of external skin which is apparent *after the parts have been returned* must be cut off with the scissors. This plan of operation is far preferable to the usual method of strangulating the whole base of the tumour by transfixing it with a needle, and tying it in two halves—first, because it is completed in half the time; secondly, because scarcely more than one-fourth the amount of tissue is strangulated by the ligature—indeed the ligature need not include much more than the trunks of the vessels supplying the tumour; thirdly, because the ligature is tied round mucous membrane at some distance from the anus, where the sensibility is much less acute, and consequently the after pain and irritation are very greatly diminished. Instead of the whole attached base of the tumour being converted into a sloughing wound, as when the whole of it is included in the ligature (and equally, I might add, when the whole of it is burnt with the hot iron), three-fourths of it is made into a simple incised wound with the scissors, and the sloughing process is confined to the upper fourth only.—*Lancet, Sept.* 2, 1865, *p.* 256.

49.—ON POLYPOID GROWTHS IN THE RECTUM, AND THEIR OCCASIONAL ASSOCIATION WITH ANAL FISSURES.

By James R. Lane, Esq., Surgeon to St. Mary's and the Lock Hospitals, and to St. Mark's Hospital for Diseases of the Rectum.

[The object of the present paper is to call attention to the association of the rarer disease of polypus of the rectum with anal fissure; the two affections apparently holding the relation to each other of cause and effect.]

In the cases before considered—namely, of hemorrhoids combined with fissure—the outward evidence of the former disease is so much more prominent and striking, that the latter is in danger of being overlooked, and of being disregarded in the treatment. The reverse, however, is more likely to happen in the cases now under consideration; for in them the fissure will in all probability, be readily discovered,—while its cause—the polypoid growth within the rectum—is very likely to escape notice. The following is a good example of this class of cases. I could adduce many more, but one will be sufficient for the purpose.

Isabella B., aged 40, needlewoman, unmarried, was admitted into St. Mark's Hospital, December 17th. She had had some uneasiness and sense of irritation about the rectum for eighteen months, with occasional loss of a small quantity of blood with her motions. For the last six months something about the size of the tip of her finger had been occasionally protruded at stool, and had caused severe pain till it had been drawn back again, which was only effected by degrees and with great difficulty. For eight weeks, however, she had suffered pain of the most acute character during and after every action of the bowels, and independent of the protrusion alluded to, which was not constant. The pain lasted nearly the whole of the day; it compelled her to keep in bed during its continuance and almost entirely prevented her following her occupation. The dread of it caused her to avoid passing a motion as long as she could, and the accumulation of hardened fæces thus occasioned of course greatly increased her distress. She had the anxious and haggard expression so often seen in persons suffering from fissure of the rectum—like that of a person labouring under severe organic disease; and she stated that she was "falling away" rapidly.

On examination, I found a well-marked fissure with indurated edges upon the sphincter muscle in the usual situation at the posteeior part of the anus. With the finger in the rectum, a polypus, the size of a nut, was readily discovered. It was attached by an elongated narrow pedicle to the posterior

part of the bowel; but it had no direct connexion with the fissure, for its pedicle was inserted nearly an inch and a half higher up. The examination was attended with severe pain from the spasmodic contraction of the sphincter muscle.

Dec. 19th. A free incision was made through the fissure. The polypus was then drawn down by a vulsellum, and a ligature was applied at its point of attachment. It was then cut off just beyond the ligature.

The result was complete relief from all the painful symptoms. The ligature came off on the fifth day, and the wound was soundly healed at the end of three weeks, when she was discharged from the hospital cured. A very marked improvement had taken place in her general health and appearance; the anxious expression of face had disappeared, and she had gained flesh considerably. She had had no pain since the operation, except the slight smarting occasioned by the fæcal matters passing over the cut surface.

Since my connexion with St Mark's Hospital, I have met with as many as nineteen cases similar to the above, illustrating the combination of rectal polypus with anal fissure. In this particular instance the protrusion observed by the patient at once directed attention to the presence of some growth within the rectum; but often no protrusion is noticed, and then the real nature of the case is in greater danger of being overlooked.

In exemplification of this, I may mention the case of a young married lady who was under my care about twelve months ago. She had suffered for many months acutely with symptoms of fissure, and during that time had miscarried, the miscarriage having been apparently brought on by the severe pain and irritation of the anus. Some weeks before I saw her she had consulted another surgeon, who had discovered a fissure, and had made a slight incision through it, at the same time removing an external pile. She was at first relieved by this operation; but as the wound healed the symptoms returned as severely as ever. When I saw her, the remains of the wound were in a highly painful and irritable condition; and on further investigation, I found a distinct polypoid growth within the rectum, attached about three quarters of an inch higher up. The removal of this, with a repetition of the incision, this time made somewhat freely, completely cured her, and she has had no return of the symptoms. Shortly after the operation she became pregnant, and she has recently been confined at the full period.

Such a mistake as this is very disheartening to the patient and very annoying to the surgeon. It is, however, not unlikely to happen to anyone not familiar with the management of

such cases; nor is this the only instance which has come under my notice. It is chiefly with the view to point out this source of error that I bring the subject forward, for the co-existence of the two conditions is not very unfrequent. To avoid mistake, therefore, it is well worth while always to examine the interior of the rectum carefully before operating in cases of fissure. The examination, however, must be made carefully and thoroughly, for the polypus, being very movable, is apt to recede before the finger, and may very easily be missed.

A few years since, Mr. Baker Brown published some cases of this kind (see *Lancet*, July 14th, 1860, p. 31), which I read with great interest, for his observations on the subject correspond very closely with my own. I cannot, however, quite agree with him in his conclusion "that a very large number of fissures of the rectum are produced by these little polypoid bodies," and that "they will be found in almost every case if carefully sought for." On the contrary, I am continually meeting with cases of fissure—and indeed they form the great majority—in which nothing of the kind can be discovered after the most careful search. I do, however, not unfrequently find a small excrescence or papilla of mucous membrane at the upper end of the fissure, exactly corresponding to the little inflamed flap of skin so often seen at its outer end; but this is of a different character, and is evidently a subsequent formation—the result, and not the cause, of the local inflammatory action which has been set up. In the cases which I have noted as examples of polypus, and to which I am now alluding, I have only used the term to designate a distinctly pedunculated growth attached to the interior of the bowel, which has had no direct continuity with the fissure, but, on the contrary, has often sprung from the opposite side of the rectum. On enquiring into their history, I have usually found that there has been some irritation about this region for a considerable period, often with loss of blood; but at a later date the acutely painful symptoms have been superadded. The earlier and milder symptoms have without doubt been caused by the polypus; and this, by continually falling against and irritating the arms, has in course of time produced the fissure.

[Mr. Henry Smith wishes to protest against the opinion Mr. Lane, in speaking of the treatment of hemorrhoids by the clamp as a new operation, and of Mr. Smith as its author. He says:]

I wish I could lay claim to such an ingenious and useful operation. By referring to page 88 of my Lettsomian Lectures, Mr. Lane can see that I have mentioned that late distinguished

Dublin surgeon, Mr. Cusack, as the one who suggested the use of the clamp and cautery thirty years ago, and I have related how in this city Mr. Henry Lee had adopted the operation, and how I was induced by the results of his experience to follow it up. The only credit I claim is of having so altered and improved the clamp hitherto used that it seems to fulfil all the purposes desired, both as regards safety and efficiency.—*Lancet, July* 22, *and Sept.* 9, 1865, *pp.* 87, 303.

50.—PERSULPHATE OF IRON IN HEMORRHOIDS.

Assistant-Surgeon Cartwright strongly recommends an ointment of persulphate of iron (℥ss.—℥j. ad oz.) in hemorrhoids, especially when these are ulcerated, or when the constitution has become debilitated by diarrhœa or excessive fatigue.—*Med. Times and Gazette, Sept.* 2, 1865, *p.* 267.

ORGANS OF URINE AND GENERATION.

51.—ON LITHOTRITY.

By William Fergusson, Esq., F.R.S., Surgeon to King's College Hospital, Professor of Surgery in the Royal College of Surgeons, and Surgeon Extraordinary to H.M. the Queen.

[Lithotrity has lately appeared likely to supersede almost completely the more formidable operation of lithotomy. The life or death of the patient often depends upon the decision whether cutting or crushing shall be selected.]

What are the circumstances which lead us to our determination? There are few questions in surgery more important, and I fancy that I cannot in this lecture address you on a more interesting subject.

Age seems to me to form a most important element, particularly in the male. It may reasonably be doubted if better can be done before fifteen than cutting for stone. The success of lithotomy in young subjects is probably greater than could be secured by lithotrity in similar cases. Taking my own experience, announced last year, of only two deaths in fifty operations, I have no hesitation in stating my conviction that I could not have had equal success with lithotrity in these cases. In some the process would have been well-nigh impossible, such as with stones of this bulk, for here the diameter of the urethra would have precluded the use of a lithotrite of suffi-

cient power. Looking to the size of the urethra in the male before puberty, its length, its irritability; the comparative irritability of the bladder and of the subject generally; and I may add, the conical shape of the bladder, whereby there would be a greater tendency to blockage and retention than in the adult, I feel justified in stating that where the operation might require repetition, it would certainly, although ever so successful, be attended with an amount of distress to the patient, and probable trouble to the surgeon, far greater than any supposed advantage. I confess, however, that I do not think this question has been investigated. Until within these few years there were no instruments that could have been used in such cases. To the best of my knowledge there were none such as I displayed in this theatre last year; but if blades like these [showing a variety] could be brought against small stones such as are usually found in young persons, so as to effectually crush them to sand, I believe that this operation might after all be found more generally applicable in children than it is usually deemed. As an adjunct to this kind of practice, chloroform would be indispensably necessary; without it the needful quietude could not be secured.

In the female, whether under or over puberty, I consider that any other operation than lithotrity should be an exception to the rule. With various-sized instruments sufficient strength of blades can be calculated on; and chloroform will permit the ready use of both crushers and scoops; so that, in accordance with views which I laid before you last year, the operation might be completed in all ordinary cases on one or two occasions.

But stone is found in the adult twice as frequently as in the young person, and, for manifest reasons, its treatment in such patients must be held as of more than double importance. It is of greater interest to consider what is best for this larger class of cases, particularly as the rate of fatality in lithotomy rapidly increases after puberty, and it is chiefly in these instances that the question between lithotrity and lithotomy arises.

There are, I suppose, surgeons in this country who still look upon lithotomy as the rule, and lithotrity as the exception. Yet I believe there is a generally felt impression that the reverse should now be held as the rule; and such is my own conviction. When stone requires mechanical treatment, lithotrity should be the first proposal, and if it cannot be, then lithotomy must be thought of. If such be the predicament, let us see by what process of reasoning the surgeon may have come to such a conclusion. He will have examined his patient, and found the

urethra narrow and irritable; the neck of the bladder and mucous membrane particularly sensitive; the prostate somewhat large, and so firm in substance that it has been difficult to pass a sharp-curved instrument; the bladder disposed to throw off its fluid contents; the stone large, perhaps more than one; and possibly withal an irritable temperament, a want of moral and physical courage, with a disposition to oppose, rather than facilitate, all manipulations. These conditions, where present, hold out most unfavourable prospects for the satisfactory or successful issue of lithotrity, and it is to me very doubtful if the operation should be resorted to in such cases. Yet it would be unwise to reject lithotrity in all at a first or second examination. It is remarkable how in some these conditions become modified. The patient may pluck up better spirit, the parts by usage may become less sensitive, the operator by custom may manage to get through the prostate more readily, and the fragments may possibly be more easily dealt with than the entire stone. All this may happen, yet it must be admitted that the conditions referred to induce at first sight serious objections to lithotrity.

It is a good custom, in many instances, to make repeated examinations before a final decision; for whilst the opposing indications may in some be favourably modified, it will occasionally happen that where at a first glance all may have appeared highly propitious to lithotrity, a condition may arise which will at once put an end to all idea of resorting to it. I have seen illustrations frequently of both these changes, and have sometimes been much struck with the effects of what may be called preliminary manipulative treatment. It frequently seems desirable to dilate the urethra with bougies before crushing, and their use is often advisable to relieve irritability—a result of which we have daily cognisance in treating strictures; but as in such cases we every now and then see considerable fever excited, and a train of symptoms particularly alarming to those who have little experience, so in using bougies preliminary to lithotrity, some troublesome symptoms may arise which may induce the surgeon to be unwilling to adopt that procedure. After the bougie the patient may in a few hours experience a chill; shivering, sickness, and vomiting may all ensue to a considerable extent; the surface of the body may become remarkably pale and cold, the pulse will be very feeble, the eye will appear sunken, the voice will be as in a whisper, and it will seem as if rapid sinking had set in. After a few hours the rigors will cease, and so will the sickness; the pulse will improve, and so will respiration. A reaction will take place, almost as alarming to the inexperienced as the previous condition. There will be rapid breathing, a bounding pulse, a flushed surface, particularly of the face, and a racking headache. Pro-

fuse perspiration will then set in, and most of the alarming symptoms will disappear. The kidneys and bladder will sympathize. At first there will be scanty and high-coloured urine, and when it becomes more profuse, as it does in the later stages, it will deposit a thick sediment, and possibly a copious quantity of tenacious mucus, in some instances joined with pus. In eight-and-forty hours the patient may be as well as over, but in some there will remain a great disposition to a recurrence of most or all of these evils. Such symptoms as these are by no means uncommon after lithotrity, and they cause much distress to the patient and anxiety to all. Everyone experienced in stricture cases must be more or less familiar with them. When, a few years ago, perineal section was more in fashion than at present, such symptoms were not unusual, and to the uninitiated caused great alarm; yet, though formidable in aspect, they are not always so in reality. Once passed off, they seldom recurred, chiefly, perhaps, owing to the cause which had induced them not being repeated. Now, if such evils are brought on by the simple use of a bougie, what might not happen after a single sitting of lithotrity?—what after frequent repetitions? A man could scarcely feel justified in subjecting his patient to lithotrity after such experience as this. I have repeatedly declined it, and have afterwards seen the best results from lithotomy. If a stone be small, and it be possible to make away with it at a single operation, I should not mind advising lithotrity on a very brief acquaintance; but if the operation is likely to require two or more sittings, then I should think it wise of the surgeon to test, as it were, his patient's constitution by a repeated preliminary use of bougie or sound.

As yet I have referred only to the cases likely to be rejected for lithotrity. Let me now speak of those which seem peculiarly favourable for the process. If the urethra be wide and free from marked irritability: the neck of the bladder and mucous membrane of that viscus be not particularly sensitive; if the prostate be of normal or moderate size, and so soft that a sharp-curved sound, or lithotrite, can be readily passed, the case will appear in most respects favourable. If, added to this, the stone be small, then all the essentials to successful lithotrity may be deemed present, and it is not likely that the bladder will be subject to spasm, nor will the patient evince much irritability either of mind or body. Even though the stone should be of considerable magnitude, or should two or more be present, there need be no hesitation in selecting lithotrity. It may be that evil will come after all, but under such circumstances the surgeon may feel satisfied that he has done the best for his patient that human judgment could dictate. Should he in the interval have had, or seen, one or more successful cases of

lithotomy, he need not repine and wish that that operation had been selected instead, for had it been, the results might have proved equally disastrous.

When lithotrity is seen in perfection, it certainly is a vast triumph of surgery. A concretion, too large to escape by the natural passage from the bladder, and which, when allowed to remain, almost certainly increases in size, and thereby adds to the daily and hourly sufferings, is broken into fragments so small that they pass away with the ordinary stream of urine ; and thus the bladder is left free and in a normal condition. The patient need not be in bed an hour beyond the customary period of rest, and may move about, attending to his ordinary duties as usual. He may walk to the surgeon's house and from it, as if paying a friendly visit, and in a few days or weeks have his mortal foe within his manual grasp, shattered to fragments, and impotent for further evil!

Certain dogmas have prevailed regarding lithotrity which had been hurriedly fixed, but which have now been dispelled by experience. Thus it was said that the operation was scarcely practicable or proper unless eight or twelve ounces of fluid could be retained; indeed, the more the better! This was under the impression that the stone could be more readily seized, and that the distended mucous membrane would be less likely to be nipped between the blades, or between these and the stone. If sufficient urine were not already in the bladder, the first step of the operation was to inject tepid water. Now I think it may be set down as a rule that a capacious bladder and large quantity of water are objectionable. They ccertainly do not preclude the operation, but they assuredly make it more difficult and uncertain. A stone or fragment moves so freely in a large quantity of water, the slightest touch causing it to change its position, that it readily eludes the blades; and, again, where such a bladder as is here implied is nearly empty, the mucous membrane may possibly be in folds, between which fragments are liable to escape the closest search. To say the truth, however, I have little faith in the presence of so-called folds of the mucous membrane of the bladder. For twenty years or more I have rarely used injections as a preliminary step, and I have often drawn off urine with a catheter when, in accordance with these views, I have fancied the quantity too large. A small proportion of fluid is decidedly better than a large, but care should be taken that the blades of the lithotrite can be used with facility, and without the chance of contusing and abrading the mucous surface.

Paralysis of the bladder such as requires the daily use of the catheter has been generally considered a positive bar to

lithotrity. But with the small scoops which I have recommended the condition is positively favourable to that process; for there is generally in such cases an apathetic state of the mucous membrane, which permits a free use of instruments required for the removal of fragments.

Some years ago we were, on nearly the highest authority, positively prohibited from turning the point of a lithotrite downwards behind the prostate gland. If this organ be somewhat enlarged, particularly in its middle lobe, there is always a kind of pouch behind; and even when of its normal size the bladder in old persons is capacious at this part. Doubtless, as a patient stands, the stone usually lies in this place. Even in the horizontal position it keeps there, unless the pelvis be raised. In early days it was the custom to lower the shoulders and elevate the pelvis, for the sake of getting the stone towards the upper part of the viscus, where it was thought it could be more readily and more safely caught. Occasionally even yet this position seems desirable; but the fallacy of not searching behind the prostate has been long since exploded. The best of modern sounds, that with the short curve recommended by Heurteloup, was constructed with the view of being turned point downwards into this pouch, and to catch a small stone or fragment with a lithotrite or scoop, there is no more certain manœuvre.

The attitude of a patient, the question if he was to lie on a bed, a sofa, or on a table made expressly for the purpose, were all thought matters of very great importance. Every now and then some little variety of attitude, from the horizontal to the erect, is desirable; but generally, in private practice, a hard-stuffed bed or sofa is all-sufficient. A pillow under the pelvis is sometimes an advantage; more, however, to keep the handle of the instrument above the mattress than with the intention of influencing the position of the stone. In hospital practice, the ordinary operating table answers all requisites, and that constructed for the special purpose of lithotrity may now-a-days be considered as a remnant of a certain amount of claptrap which was associated with the early history of the operation.

The question as to the propriety of giving chloroform in lithotrity seems still a moot one in certain quarters; but I have none regarding it, and having used it in the greater number of the cases I have had ever since anæsthesia was introduced, I can speak of it in unqualified praise. There are many instances in which it is not requisite, but I am certain that without it the operation would be well nigh impossible in a considerable number.—*Lancet, June* 17, 1865, *p.* 643.

52.—ON LITHOTOMY IN THE ADULT.

By William Fergusson, Esq., F.R.S., Surgeon Extraordinary to H.M. the Queen.

The causes of the successful issue or fatal result of lithotomy in cases reasonably well selected and operations reasonably well performed, are problems of deep interest. It is now two-and-thirty years since I first performed lithotomy, and, with a large personal experience, I feel yet unable to offer decided opinions regarding these problems. Hearing, as I have occasionally, of wonderful success, I have had my suspicions that the expression has been used by some to indicate the mere extraction of the stone, and not the final issue of the operation. Breaking a stone in lithotrity, and extracting in lithotomy, have, I fear, been taken by some as the standard of success—the issue has been ignored! There seems to me to be a mystery associated with lithotomy that has not yet been solved. For palpable errors there is an explanation; but when, to all appearance, there has been perfection in the operation, and yet death has been the issue, I confess that I have been puzzled beyond measure. I have performed lithotomy without a shadow of strain, tax, or tension on the parts more than the needful manipulations, yet the issue has been fatal; and again I have been conscious of an amount of rudeness such as has made me tremble for the result, yet an untoward symptom has never once appeared. I have, indeed, seen badly-performed operations where nothing but death could have been anticipated, and where the anticipation was realized; but I have known such an amount of force and haggling end successfully that I have been amazed. I have known several strong men pull at a nine-ounce stone for an hour, when the patient has been put to bed well-nigh exhausted; yet on the stone being extracted eight days afterwards the final result was perfect. With such experience as I have I cannot pretend to explain these seeming mysteries. Working on inanimate material, no doubt precise manipulation must be of the most perfect effect; but when the phenomena of life are afterwards involved, the result seems in most instances to be beyond human control. Cutting or sparing certain tissues or parts seems to me of little moment as regards the grand result; yet, as it may be thought that these doubts and hesitations are scarcely becoming on the part of a Professor of Anatomy and Surgery to the Royal College of Surgeons of England, I shall endeavour to put some of my views in a more palpable shape and aspect.

Much stress has in modern times been laid upon cutting that part of the pelvic fascia which is reflected upwards on the neck of the bladder from about the middle level of the pros-

tate; but I am very doubtful of the pathological views on which the objection is founded. I doubt if such division is often made, and supposing it is made I doubt much the result which has been said to follow as a matter of course—viz., infiltration of urine, leading to suppuration and death. Infiltration I believe to have been the bugbear of modern lithotomists. With my own experience, and all that I have observed otherwise, I declare that I have never seen a genuine case of urinary infiltration. I have seen cases where the surface of the wound has evidently been irritated by the urine, but I doubt if any serious evil has ever arisen on that account. If there has been unhealthy or fatal inflammation, I fancy that it has come concurrently from some other cause—some unhealthy and unforeseen state of the constitution. There is such resemblance between infiltration and diffuse inflammation of cellular tissue, that they are, I believe, often confounded. Serous and lymphatic effusion so much resembles urinary infiltration, that when it occurs in the track of the wound in lithotomy such a mistake (as I consider it) as that I allude to is not unlikely.

Infiltration of urine, I maintain, never takes place when there is such a free passage as that after lithotomy. The diffuse swelling in cellular tissue so characteristic of infiltration, is never present after lithotomy even in fatal cases. Surgeons are familiar with ordinary infiltration, and how readily the urine escapes when incisions are made in such cases. All my experience leads me to say that infiltration is one of the rarest causes of death after lithotomy.

Whilst making this statement I am not disposed to refer lightly to that free incision of the prostate which implies a division of the reflected portion of the pelvic fascia. On the contrary, I advise that it should be left untouched, and declare my conviction that stones of great magnitude may be removed without such free use of the knife. There are those who in this operation have come well up to *Mercutio's* idea of a fatal wound: "Not so deep as a well, nor so wide as a church door." Yet withal the gap has been big enough to be fatal; and both depth and width have often, I fancy been the cause of evil in this wound. Depth which has gone through the prostate, wounded the bladder when needless, and even penetrated the rectum, or possibly the peritoneum—width being implied by these very features.

Whilst admitting that patients have often recovered after huge and so-called free incisions about the neck of the bladder, I am, however, strongly impressed with the idea that a limited incision is safest. It implies, in my estimation, less injury to important parts. But I scarcely recognise as legitimate any

incision in the neck of the bladder which will permit the egress of a stone without at the same time a certain amount of dilatation, or it may be laceration.

Stones of one inch or more in diameter are of very common occurrence; and the circumference, three inches, required for the egress of these is in proportion. Now I believe that if the surgeon aims at making an incision in the neck of the bladder equivalent to the free egress of these without stress or strain, he makes a wound of the most dangerous magnitude, from which the patient is not likely to recover. I dare not, I cannot, say that wounds of the membranous portion of the neck of the bladder beyond the prostate are certainly fatal; on the contrary, I believe that they are not so on all occasions; but I am as firmly impressed on this point that there is great comparative safety when a rim of prostate is left at the base of the wound of that gland. I am equally confident, too, that stones of large size may be removed through a wound of this organ which has been, as regards the application of the knife, of comparatively limited extent.

These latter remarks, it will be perceived, bear upon a very interesting and much controverted question as to limited or free incisions in the neck of the bladder. I doubt if this question will ever be settled, but on my own part I have no hesitation in declaring my preference to a limited incision, for I believe as implicitly in dilatation here as I do in the neck and mouth of the uterus in parturition, even though the latter is effected by nature, whilst the former is by force on the part of the surgeon. I am so strongly impressed on this point that I do not object to the term laceration which has often been applied to the somewhat forcible extraction of a stone; for my opinion is that laceration, provided a margin of prostate is left, is safer than the so-called free incision, which fairly divides the left lobe of the prostate and runs into the membranous portion of the bladder. But in advocating a limited incision internally, I am equally convinced that a free external wound is of importance, for it greatly facilitates the deeper and more delicate part of this operation. When the distance between the surface and bladder is great, partly from obesity, partly from enlargement of the prostate, if a free incision be made, the knuckle of the forefinger may be buried in it, so that the point can be more readily placed within the prostate or the bladder, while it permits the more free and safe use of forceps, both in passing them into the bladder and in extracting the stone. Without this free space, there is a risk, in introducing the forceps, of passing them between the bladder and pubes, or between the bladder and the rectum. Moreover, in extracting a large stone, there is a freedom given to the leverage of the forceps, which, whilst

much appreciated by the accoucheur, has been too little thought of by the lithotomist.

The difficulties of lithotomy in the adult are, I apprehend, largely of the surgeon's own making. He limits the wound perhaps, making it too narrow throughout, particularly on the surface; or in not penetrating into the bladder, whereby he runs the risk of the blunder of making a space between the pubes and prostate, that which in my lecture last year I endeavoured to impress emphatically as the grand source of failure in the operation in children; or he places it too high in the perineum, thereby setting his work too much in that dangerous strait, the angle of the pubes; or he does not make a proper use of the forceps either in clutching the stone or in drawing it from the bladder.

When the perineum is so deep that the finger cannot reach the bladder, the operator must do the best he can to introduce the forceps, always taking care under such circumstances that force is not used, for if he has cut into the bladder the forceps should glide along with a gentle push. If he has not confidence in simplicity (guided by anatomy) at this stage, he may make use of a blunt gorget, an instrument which seems now to be in a manner out of fashion, although in recent times its use has been revived as an aid in mesial lithotomy.

As to a wound rather high in the perineum I take but little account of it, provided the operator in using the forceps draws them downwards, and does not persist in working in this space, or even drawing the stone upwards, as has occasionally been done with fatal effect.

The greatest cause of trouble, and even failure, in the actual completion of lithotomy I believe depends upon not grasping the stone. I have often seen all the steps well performed up to this one; but here difficulties, seemingly unaccountable, have arisen, and the worst evils have followed. I was early impressed with this feature. An hospital surgeon of limited experience operated on a case of stone, and did the work well until he began to extract. Here the easy movements ceased. No sooner did he attempt extraction than the forceps slipped. Effort after effort was made, but all to the same effect. In all surgery I do not think that there is so much concentrated energy of mind and body required as in lithotomy, and it is the more exhaustive too, in my opinion, because it has in a manner to be concealed. This was probably the effect in the case I now allude to. The operator, a man of considerable physical powers, became exhausted, not, however, until the lapse of about an hour, and when he and the patient were both well nigh in a similar plight, another surgeon, a master in the art, took the forceps, and extracted the stone with the utmost

facility. It was the size of a lemon, and most operators would have had some trouble with it. The fault with the beginner here was, that he did not take the stone fairly within the clutch of the blades; he only nibbled at the end. But the second man put the blades upon its sides; in other words, he inserted them deeper into the bladder, whereby he was enabled to grasp the stone by its middle, so that it could not escape from the instrument, and the small resistance of the neck of the bladder was as nothing compared with the energy of his hand and arm. It has fallen to my lot on two different occasions to extract the stone eight days after failure by other surgeons. In both instances I believe that the cause of failure was that the stone was never properly within the grasp of the blades. It is by no means an uncommon supposition, that the bladder in certain cases encircles the stone so closely that there is no room to get the blades between; but this I fancy is a great error. No bladder that I have ever seen could resist the surgeon's power in expanding the blades, and pushing them in the proper direction.

As to adhesion of a stone to the bladder being an impediment to the fair performance of the operation, I believe it to be a myth. I certainly have seen instances where the bladder and stone have held close approximation by asperities on both, but it never appeared to me that these could for an instant withstand the influence of the surgeon's hand on the forceps.

Cysts containing stones are occasionally met with, and I have seen some remarkable instances; but we hear more of these from bunglers, who have operated only several times, than from those who have had large experience.

The dangers of this operation during performance are indeed few and far between, particularly when the incisions are made with a scalpel of moderate dimensions; but of course this, in unskilful hands, might prove as fatal as the dagger of Jacques, the cutting gorget, or any other ill-proportioned, ill-contrived weapon which has from time to time been used in this classical operation. I give the preference to this instrument over all I know, yet, if rashly used, it may do harm equal to any I ever heard of.

A wound of the rectum I look upon as of little moment as regards the final result of the operation. There is little or no additional danger to life in such a wound; but it is a blot in the operation which should be avoided. The accident has happened to me repeatedly; I have recognised it twice in post-mortem examinations, the patients having died from other causes when I was not aware that it had happened. I have seen it once in the form of a communication between the gut and the

membranous portion of the urethra, months after the external wound had healed, and where, being very small, it gave the patient but little inconvenience. Twice I have recognised during the operation that the accident had happened, and in both of these I considered that the rectum had been torn whilst extracting.

The latest writing of a lithotomist may be taken as his last report; and in this sense I may state that Cheselden, having cut in public 213 cases, lost only 20. In my own practice in King's College Hospital, I have cut 100, and of these 15 have died. Mr. Solly has told us within the last few weeks that of 63 cases in all, public and private, he has lost 14. Crichton's statements included both public and private; and as Cheselden did not publish the results of his private practice, we are entitled to infer that the Dundee practitioner in the nineteenth century was more successful than the reputed hero of British lithotomists in the eighteenth century.

But any humble merit of mine that may be associated with this address and that delivered two days ago is, in my estimation, now to be told. I can give a list of lithotomy, and lithotrity conjoined, which, in as far as I know, has fallen to the lot of few other men in Britain. I have personally by operations treated 271 cases—162 by lithotomy, and 109 by lithotrity. Although having been little more than half the time of Crichton's experience, I have had 70 cases of the disease more than he had. Of the 271 I have lost 47; and that shows a mortality of something more than 1 in 7—not a bad average as operations for stone go; but lithotrity cases being included, I consider it low indeed. And I have now to state that which I look upon as of high interest in the modern history of surgery. Of these 271 cases, 217 were adults; 110 have been treated by lithotomy, and of that number 33 have died; 109 have been treated by lithotrity, and of that number 12 have died!

Here is a contrast between the two operations of lithotomy and lithotrity as practised by the same person. I refer to it as an indication of the favourable progress of surgery during the time in which I affect to glance at its history. In my own hands, whatever clumsiness or skill they may possess, the operation of lithotrity has been considerably more successful in regard to saving of life than that of lithotomy.

If I am not mistaken, this is the first time that such a comparison has ever been made by a British surgeon, who has had large experience in both operations, and I trust that my example may induce others in high places, who have dealt largely with both sides of the question, to give us the benefit of their experience.—*Lancet, June* 24, 1865, *p.* 669.

53.—ON THE TREATMENT OF STRICTURE.

By Dr. William Rutherford, late Resident Surgeon, Royal Infirmary, Edinburgh.

[Unfortunately every radical method of treating stricture hitherto proposed is liable to be followed by disastrous consequences, so that the occasional occurrence of a similar result should not be considered an insuperable objection to a new method of operating, if that operation is not more fatal than the others, and is moreover possessed of several advantages which render it preferable.]

The method of treating stricture proposed by Holt is applicable to all cases where gradual dilatation by bougies has hitherto been recommended, and also to some cases where perineal section has been advised. Over the treatment by bougies it possesses the advantage—important to most patients, but especially so to those met with in hospital practice—of requiring, in ordinary cases, a comparatively short time for its successful completion; and further, although the morbid tendency to the formation of stricture is, in most cases, not removed, the stricture is much less liable to return than where gradual dilatation has been adopted.

With perineal section, Holt's operation cannot be properly compared, for the former will probably never be superseded by the latter,—at any rate, in the treatment of irritable stricture, and most cases of stricture complicated with perineal abscess or fistulæ. That, however, a case of stricture with perineal abscess and subsequent fistulæ, may be successfully treated by Holt's method, Case 5 affords sufficient proof; and, further, the same case and Case 8 show that a dense cartilaginous stricture—and Case 12, that a pretty tight traumatic stricture—may be satisfactorily treated in the same manner. Probably, resilient strictures will be found amenable to the same treatment.

With internal urethrotomy, Holt's operation may be favourably compared: here again, however, the comparison is not quite fair, for death has most frequently followed urethrotomy, in cases of irritable stricture, where, had Holt's operation been performed, not improbably, a higher rate of mortality would have resulted. Internal urethrotomy, as may be performed by Maisonneuve's most ingenious urethrotome, has not been so generally adopted by the surgeons of this country as the merits of the operation would appear to indicate. In France, although its good effects have frequently been less permanent, it has much more seldom been followed by fatal results than perineal section. In the case of ordinary organic stricture, it possesses no advantage over Holt's operation, and, indeed, is not so safe; but for irritable stricture it seems, judging from present experi-

ence, to be preferable to perineal section. In internal urethrotomy, the great difficulty has hitherto been, to obtain an instrument which will divide the strictured portion of the urethra, and nothing more; and, moreover, one which can be used in tight strictures. Maisonneuve's instrument, which is far superior to Civiale's, admirably fulfils these indications.

It may, perhaps, be of service to give a short résumé of the treatment generally adoped in the above cases where Holt's operation was performed. If the stricture did not readily admit a No. 3 bougie, it was necessary to dilate it gradually by the passage of bougies until that size could be easily passed. The patient was directed not to pass his water on the morning before the operation, in order that, after the passage of Holt's instrument, satisfactory proof of its being in the bladder might be obtained by the flow of urine through the fine catheter contained in the instrument. This valuable precaution was on no occasion neglected: indeed, so strongly did Mr. Spence insist upon its being attended to, that in one case, where the bladder had unfortunately been emptied just before the time for operation, he, although almost positive that the instrument was in the bladder, postponed the operation until urine accumulated in the bladder. The full-sized dilator was most frequently used, but the calibre of the urethra was always previously measured, in order that it might not be dilated beyond its normal size. The operation was usually performed in bed, as rigors were in that case less liable to supervene.

Immediately after the operation, a catheter of the same size as that to which the urethra had been dilated was passed, and the urine drawn off, thereby proving the complete division of the stricture. After the operation, the safe precaution of not allowing the patient to micturate unless with the aid of a catheter, was adopted in all, excepting Case 12,—(which, although placed for convenience in this report as the 12th Case, was in reality among the first operated upon.) Possibly had this patient been prevented from passing urine over the recently torn surface, the subsequent infiltration of urine might not have occurred. It would not, however, be fair to conclude, that, because infiltration had followed the non-employment of a catheter for two days after the operation in this case of *traumatic* stricture, it would also be liable to supervene after operation in cases of *organic* stricture; for, in the latter, the laceration of tissue is confined to the mucous membrane and the submucous strictural tissue; whereas, in a traumatic stricture, the stricture has usually no such definition, and it is, consequently, impossible to say how far the laceration produced by forcible dilatation may extend; it is, however, even in cases of organic stricture, a safe precaution, and one most acceptable to the patient, for

the careful passage of a moderate-sized instrument is much less painful than the contact of urine with the raw surface. In Case 9, the passage of the urine through the torn urethra gave rise to rigors, fainting, and far greater pain than the operation itself did.

After the first two days, a full-sized instrument was occasionally passed to prevent recurrence of the stricture, and the patients were instructed how to pass an instrument, and enjoined to do so, or to have it done, once a-month or so.

With regard to the internal treatment, the patient was prepared for the operation by having his bowels moved, if necessary, by a small dose of castor oil,—by rest in bed, diluents, hyoscyamus, and alkalies, if there was any tendency to irritation in the urethra. A grain of quinine thrice daily, with abundance of nourishing diet, was given if the patient's general health was below par; immediately after the operation, a third of a grain of muriate of morphia in a suppository was introduced into the rectum, and five grains of quinine given thrice daily during the first three days, in order to check the tendency to the occurrence of rigors. Mr. Spence has found this small dose prove quite as efficacious as the much larger dose recommended by Mr. Holt. When rigors occurred, brandy toddy and other hot drinks were given, and hot-water bottles were placed round the patient.—*Edinburgh Med. Journal, Sept.* 1865, *p.* 257.

DISEASES OF THE SKIN.

54.—ON THE TREATMENT OF PRURIGO.

By J. L. Milton, Esq., Surgeon to St. John's Hospital for Skin Diseases.

In all obstinate cases, and particularly in the prurigo of old people, I would advise that immediate recourse should be had to a course of strychnia, and after this course of arsenic. The strychnia may be given in doses of a sixtieth or sixty-fourth of a grain in solution every three or four hours till a decided effect is produced upon the disease, or till nervous symptoms show themselves, when it may be left off: a vigorous course of arsenic should follow it. Nux vomica was a favourite remedy with Neligan, but I believe we are indebted to Dr. Burgess for this mode of exhibiting its active principle. These remedies sometimes act like a specific upon the pruritis, and when this symptom is once thoroughly quelled we shall generally have little trouble in dealing with any change in the skin. I am quite of Mr. Hunt's opinion that prurigo is not such an intractable disease when properly treated, although such an

opinion may be looked upon as a modern heresy. Under the old plan of treatment it seems to have resisted every attempt to subdue its malignity, and perhaps there were more suicides from prurigo than from all other diseases of the skin put together. Mr. Hunt says, "of the entire recovery of a patient thus afflicted, or even of considerable alleviation of suffering, not one single gleam of hope can be gathered from any author who has written on the subject. And yet there is no truth in the whole circle of medical science more vividly impressed on my own mind, than that, under proper management, arsenic is an effectual remedy for this disease." Mr. Hunt bleeds to faintness in refractory cases before giving the arsenic; in one case he took about seventy ounces of blood from the arm, and probably fifteen additional ounces by leeches; and certainly his success in cases which but a few years ago were given up to despair, seems quite to justify his confidence in this powerful means of treatment. He also gives cod-liver oil with the greatest advantage. Lisfranc, in cases where the itching was connected with difficult menstruation, used to bleed the patient a little each time, which always proved an effectual cure in the long run.

Mr. Startin's treatment of prurigo is that of lichen; he relies greatly upon mineral acids, chalybeates, opium, and ammonia, and has never found benefit from mercury or arsenic; on the contrary, they rather do harm. In a very severe case of prurigo formicans recorded by this gentleman, twenty drops of dilute sulphuric acid and ten of Battley's sedative three times a day, followed by tincture of muriate of iron in infusion of quassia and an opiate at bedtime, proved perfectly successful. These means, however, were powerfully seconded by the use of an ointment of white precipitate of mercury and creosote, ten grains of the salt and a few drops of the fluid to an ounce; and after this a weak solution of bichloride of mercury in creosote water, used warm; later on, the ointment was entirely discontinued, and bisulphuret of mercury was added to the lotion. A strict diet, consisting of milk, bread, and boiled meat, was observed. Mr. Startin finds hot-air baths and cinnabar fumigations of great service. Dr. Neligan used to prescribe iron in infusion of hops, with the juice of conium, of which he used to order pretty large doses. He found great benefit from the use of this remedy along with magnesia in senile prurigo.

In some cases, particularly where prurigo attacks the pudendum, scrotum, or anus, the itching is so intolerable that something must be done for it. Mr. Wilson recommends in a general way that the skin should be frequently rubbed with a damp sponge dipped in fine oatmeal; after this the tincture of croton

(made by steeping an ounce of bruised croton seeds for a week in four ounces of spirit), is applied, and after this has been done a few times, a lotion of bichloride of mercury in almond emulsion, fifteen or twenty grains to a pint, will often complete the cure. The Turkish bath is also said to have entirely cured prurigo. Painting the surface with iodine is useful, as is also glycerine applied with a sponge. Bleeding will often act like a charm in allaying the horrible itching, but Mr. Wilson frankly admits that at times all remedies fail to subdue it, so that his experience is rather different from that of Hunt, who treats prurigo as a very trifling matter. For the affection of the pudendum Bateman recommends a lotion made of two grains of bichloride (oxymuriate) of mercury in one ounce of lime-water. Mr. Wilson says the juniper-tar ointment is peculiarly valuable in this variety. In pruritis of these parts, injections of very hot water, juniper-tar ointment, blisters to the thighs, and small bleedings seem, from all accounts, to be the most reliable remedies. Mr. Wilson has found an opium injection relieve the irritation after all other means had failed. Strong nitric oxide of mercury ointment, and podophyllin in doses of one-sixth of a grain, are said to have proved of great service in prurigo of the anus. Mr. Startin, in a case related in his lectures, where the scrotum was also affected, directed mucilaginous hip-baths, daily ablutions with yolk of egg and tepid water, the application twice a day of very dilute mercurial ointment, with a few minims of creosote, strict diet, and one-sixth of a grain of bichloride of mercury in cold infusion of hops three times a day. The case was very severe, and occurred in an old man, but a cure was effected in little more than two months. In the prurigo of old people generally Mr. Startin's prescription for external use is a liniment of glycerine and trisnitrate of bismuth, or powdered talc rubbed in with a flesh-brush. Dr. Frazer recommends for trial finely-powdered camphor, mixed with six or eight parts of rice or potato starch, and a small quantity of acetate or carbonate of lead. This is dusted on the skin three or four times a day, and calomel ointment is used at the same time. Latterly Dr. Neligan confined himself almost entirely to chloroform ointment, which seems one of the best, if not the best, ever introduced. It is made by mixing half a drachm with an ounce of cold cream.

Possibly I have had a long series of mild cases; but, as I have already said, I have not generally had much difficulty in treating prurigo, though my prescriptions for external applications are confined to pure soft soap of the pharmacopœia well rubbed in, and bathing directly after with *very* hot water, or getting into a very hot bath. If nothing else be gained, free perspiration is promoted, and though this is no panacea, yet it

is attended with relief. Prurigo often arises in persons who have nothing to reproach themselves with in regard to cleanliness. Mr. Startin, indeed, says that this neuralgic itching is perhaps more frequently met with in the respectable walks of life than any other cutaneous affection. Such persons often seem surprised at being told to make a free use of hot baths, but they forget that they do not take sufficient exercise to keep the skin in a healthy state. Elderly people in good circumstances, and people who have retired from business, often seem to think that it is hardly respectable to go beyond a steady walk, and that while their appetite remains good and their bowels are open, nothing more is needed; but prurigo won't yield to such gentle means, and till regular active exercise has become a settled habit the action of the skin must be encouraged. In all cases I think no woollen ought to be worn next the skin.

Hebra views prurigo in the gloomiest light; the picture is filled in with the darkest and most sombre tints that utter despair of success can lend. The patient is doomed—the relentless malady only leaves him in the grave. The complaint is not difficult to cure—*it is incurable!* and all the physician can do is to make his condition a little more tolerable. He seems, however, to have never made trial of Mr. Hunt's plan, and I cannot see how success is to be expected from merely local means. The only remedies which have ever been shown to possess certain control over prurigo are arsenic and cod-liver oil, and these ought to have a fair trial in every case before it is pronounced incurable. Hebra says placing the patient in a tar or sulphur bath renders his condition more endurable.—*Milton on Diseases of the Skin, p.* 6.

55.—ON THE TREATMENT OF INFANTILE STROPHULUS, PRURIGO, ETC.

[The itching attendant on many skin diseases is so intolerable, and difficult at times to relieve, that any hint is valuable. Dr. Martin, of Bercy, has used the bichloride of mercury as a lotion with great effect. He says:]

"In my young patient I replaced the bath by lotions with a solution of two grains of bichloride of mercury in five ounces of water; but this dose proved too large, and aggravated the symptoms in the same manner as sulphurous baths. Disheartened by this failure, after further experiment, I again resorted to lotions with sublimate, but of inferior strength, viz.:

℞. Hydrarg. bichloridi, gr. j.; aquæ destill., ℥v.; alcohol, ℥ij.

The affected parts were bathed three times a day with this preparation, which was allowed to dry on the skin. Prompt improvement followed. I then progressively increased the quantity of the salt, and in the course of a fortnight, on the average, I succeeded in effecting a cure of an affection which in most cases had lasted three, four, or five months, in spite of the exhibition of a variety of remedies which had proved unavailing, or, at best, had given but temporary relief."

We may remark that in the complex disease termed *prurigines strophulus*, the lichenoid eruption is of very secondary importance, and the prurigo, on the contrary, is the most prominent feature, and has a more urgent claim on the practitioner's attention. Now, amongst the local remedies which are especially serviceable in cutaneous neurosis, lotions with corrosive sublimate are unquestionably the most efficacious, and may be resorted to with confidence, of course, in doses proportionate to the peculiar irritability of each patient. It is safer to begin with a weak solution, which can at will be increased gradually, according to its effects.

Mr. Hardy views, it is true, corrosive sublimate baths as an extremely powerful cutaneous sedative; but he also prescribes lotions with the same substance, especially in the localised forms of *Prurigo podicis*, *P. scroti*, *P. pudendi muliebris*. In these affections, and generally in all those, with the exception of scabies, in which pruritus is the most prominent and distressing symptom, Mr. Hardy advises lotions repeated several times daily with four ounces of warm water, to which is added a teaspoonful of the following preparation:—

℞. Hydrargyri. bichloridi, gr. xvi.; aq. destill, ℥iv.; alcohol, q. s.

—*Journal of Practical Medicine, Paris, Sept.* 1865, *p.* 374.

56.—ON THE TREATMENT OF ALOPECIA.

By J. L. Milton, Esq., Surgeon to St. John's Hospital for Skin Diseases.

For the simple falling of the hair in grown persons, which is often due to a mild species of erythema or pityriasis, Mr. Wilson advises that the hair should be cut with great care, and by a person thoroughly skilled in the matter. The tips of all the hairs require to be cut off; this is the grand point. A secondary but still most useful one is the use of a spirit wash and a stimulating pomatum. The same treatment with free brushing is applicable to general falling of the hair as also to area; the head

is also to be washed in cold water and dried with a hard towel; it is then to be well brushed, the great point being it seems to brush the skin more than the hair—steel medicines and tonics being also requisite. For this strictly local form (area) Mr. Startin uses, among other remedies, a lotion composed of infusion of white hellebore, bichloride of mercury, sulphurous acid and glycerine, applied warm with a soft brush; he has generally found a few applications of this prevent the falling of the hair, and extension of the disease from any patches which may happen to exist. The use of this lotion is followed or accompanied by friction, with an ointment made of two ounces of fresh lard and the same quantity of cold-drawn castor-oil, half a drachm of tincture of kino, the same amount of Goulard's extract, and twenty minims of oil of rosemary. Dr. Frazer employs a lotion consisting of an ounce of aromatic vinegar and six drachms of Spanish flies, united with six ounces of rose-water, and the same of either rum or whiskey.

In all cases of obstinate or confirmed alopecia, my own experience would lead me to rely entirely upon two remedies and on these only; they are the internal use of arsenic and the external use of the Spanish fly. A regular course of arsenic should be given as for an obstinate form of erythema or pityriasis, of which indeed area is only a sub-variety. As to the cantharides, fancy or experience will readily enough dictate some form in which this potent ingredient can be applied. Perhaps Mr. Wilson's unguentum stimulans, mixed with two or three times its weight of scented-leaf-marrow pomatum is as good as could be found; but the cheapest and most certain method that I am acquainted with, is simply to powder the fly and macerate it in glacial acetic acid for a fortnight. The mixture at first should be almost as thick as printer's paste; after a short time a clear fluid gathers at the top, and this, after being strained off and well brushed over the bald surface, or rubbed in with a piece of lint, is by far the most powerful vesicant for a cheap preparation that I know of. A piece of skin the size of a shilling is blistered every second or third day, and in this way the whole of the surface may be operated on without any great soreness being induced. Care should be taken to keep the fluid from the fingers. I have suffered severely from handling it carelessly. Bullin's blistering fluid is also a most valuable preparation, but on account of its cost is not so well suited for hospital or dispensary practice. When patients will not submit to blistering, frictions with a mixture of spirit of horseradish, tincture of cantharides, and Cologne water may be tried instead; but this method is far more expensive and less certain than the other.—*Milton on Diseases of the Skin, p.* 14.

57.—ON THE TREATMENT OF TINEA.

By J. L. Milton, Esq., Surgeon to St. John's Hospital for Skin Diseases.

First of all we may eliminate all true pustular diseases of the scalp, that is to say those which really begin with pustules, or of which pustules form the predominating feature, and refer them to impetigo, which is not a contagious disease at all. In some of the scalp diseases, pustules may complicate a true scurvy (or tinea) disease. Next vesicular diseases, if such really exist, for I never saw one, may be thrown out; vesicles however may, like pustules, complicate the tinea group. Thirdly, true eczema, or a weeping of the surface, followed by crusts and that form of eczema where there is inflammation of the derma in spots, followed by thick resin-like little crusts, may follow the same path. Thus there remain the true tineæ, dry, scurfy, reddened patches, accompanied by clipping, shedding, twisting, and loosening of the hair, and a secretion of scales, which in favus may even assume the form of crusts; and in this group I would embrace every form, from area to favus, as they are all grades of essentially the same process; the hair-follicles are involved in all, and if there be contagion in a disease of the skin we find it here, and here the vegetable theory must find its city of refuge.

Mr. Hunt considers the diagnosis of these diseases impracticable. "I do not hesitate," he says, "to pronounce it impossible to give a distinctive name to one in fifty, or to determine by its appearance only whether it be contagious or not." I respect Mr. Hunt's opinion in such a matter quite as much as I admire his determination and honesty in speaking out so plainly, but I think if the rule I have mentioned be adopted the diagnosis will be facilitated.

If I understand Dr. Tilbury Fox's views aright, he contends that the parasitic growths on the skin are as truly vegetable in their nature as the mould upon an orange or melon, because we can distinguish the presence of cellulose externally, and can see internally the primordial utricle coloured by iodine, and because we find in the secretions of these diseases the tubed mycelial thread and a fructification unrepresented in animal structures. Ether, chloroform, and spirits of wine do not affect these parasites, while they make epithelial tissues transparent, and dissolve all fatty matters. The parasites mostly grow in places to which the air has free access, exceptions to this rule admitting of doubt; they grow too alone when removed from the influence of blood and living tissue, a separation which is fatal to animal life. A piece of favous matter, if fittingly nursed and tended, will take root and flourish; the nuclear

element will assume the sporular form, the sporules will gain in size, join, bud, and bring forth mycelium, while the very structure on which they are seated is decaying. Dr. Fox showed his friends a beautiful specimen of the tricophyton tonsurans which had blossomed sweetly, while the fibres of the hair on which it was seated had degenerated, and their place had been supplied with beautiful tufts of crystalline fatty matter.

Dr. Fox further argues: "Take away the damaged hairs, &c., of tinea, and nothing diagnostic of the ravages of the parasite remains. *Per contra*, remove all the eruptive and the parasitic remains in its integrity: the necessaries remain, but the accidentals are absent. The presence of the fungus increases the local irritation. . . . Now if the fungi be different there must be different soils, and the treatment be different in kind. If the fungi be identical in nature, then the treatment is a matter of degree only; if fungi be different, then ought they to be so many indices to states of economy, states which in time will be fully interpreted."

Dr. Fox argues, that to cure the disease and to destroy the fungus you must root out the hair. Pull out every hair that is diseased by gentle means if you can, but pull it out. Dr. McCall Anderson is also unreservedly in favour of depilation, both in tinea tonsurans and sycocis. Dr. Hillier says that tinea tonsurans and tinea favosa cannot exist without their respective fungi. These we must destroy, and nothing destroys more promptly than compound sulphur ointment. M. Bazin saw no safety but in pulling out the hair, and there can be no doubt that these views have found a pretty wide acceptance.

Mr. Wilson gives us his treatment of these diseases. Chloasma and sycosis being elsewhere touched upon, I propose to omit all mention of them, and confine myself to what has reference solely to tinea and favus. Mr. Wilson's general directions then are: Remove the crusts and furfuræ by thorough washing with juniper tar or petroleum soap, or by the use of a liniment consisting of equal parts of soft soap, juniper tar, and alcohol; wash daily with tepid or cold water to cleanse the diseased parts and gently stimulate the skin of the head; comb the hair and brush it when it is not too sensitive; rub in night and morning a very dilute ointment of the nitric oxide of mercury; give tonics, cod liver oil, and iodide of iron, arsenic, &c.

Mr. Wilson then goes on to say: "And this brings us to the question of the use of depilation: that it disposes to the cure of the local disease there can be no doubt. We cannot disbelieve the statements of Bazin that he succeeds in curing these diseases through the agency of depilation; but we do and must disbelieve that the removal of the fungus is the proper explanation of the cure. We see in depilation

a stimulant, and a valuable stimulant—a stimulant that we ourselves commonly use when we seek to make a black hair grow up in place of one that is white—a treatment that for this purpose we have been in the habit of using for years, and with remarkable success; so that we have been led to regard avulsion as one of our best, indeed our only reliable remedy for producing *deep stimulation of the cutaneous tissues*, for setting up a new action in the papillæ of the hair; as the only remedy, in fact, by which we can reach successfully the fundus of the hair-follicle. And this, in our belief, is the 'methodus medendi' of depilation and avulsion in the phytodermic diseases. It sets up a new action, a healthful inflammatory process in place of a morbid inflammatory process—a process whose natural course is to end in resolution, instead of one whose nature is perpetuity. For morbid cell-genesis it establishes healthy and plastic inflammation and sometimes healthy suppuration, when, as Bazin declares, the fungus is starved or drowned. Even Bazin has recourse to avulsion as a stimulant in old cases of mentagra, wherein the hair acts the part of a foreign body, of a thorn, in the skin, and so keeps up irritation."

Mr. Wilson's particular treatment of tinea is sulphur and cream of tartar; cod liver oil, especially if there be struma, citrate, acetate, and hydrochlorate of iron, iodide of iron, iron with quinine, nitro muriatic acid, a good diet, and plenty of porter.

The hair is to be cut, and the crusts to be detached with water-dressing, the head is to be washed with old-fashioned yellow soap. The patches are then well painted with tincture of iodine or strong acetic acid or vinegar of cantharides. After this an ointment of one of the nitrates of mercury is well rubbed in. When ointments are objected to, a lotion of sulphuret of potassium, a drachm to a pint, or of bichloride of mercury, a grain to an ounce, may be used instead. The dry scurfy state of the skin which may remain is generally removed by dipping the head in cold water, and rubbing in some simple pomatum.

Dr. Frazer recommends vesicating collodion and strong iodine paint for the patches of tinea. Dr. Fox speaks highly of carbolic acid for this complaint, as does also Dr. Frazer; it dissolves freely in alcohol, ether, or glycerine, but very sparingly in water. Mr. Startin uses a compound sulphur ointment of his own, and Dr. Jenner recommends one in all essentials the same as Mr. Startin's, composed as follows: "half a pound of sulphur, half an ounce of ammonio-chloride of mercury, and the same amount of sulphuret of mercury, four ounces of olive oil, sixteen ounces of lard, and twenty minims of creasote."—*Milton on Skin Diseases, p.* 16.

58.—ON ECZEMA, AND ITS TREATMENT.

By J. L. Milton, Esq., Surgeon to St. John's Hospital for Skin Diseases.

[Almost up to the present time eczema has been classed with scarcely a dissenting voice among the vesicular diseases. These vesicles, however, are by no means an essential feature of eczema. In a paper read now nearly four years ago before the Medico-Chirurgical Society, this view was advocated by Mr. Milton, who considers that more accurate observation of the disease will convince the profession that true eczema is *not vesicular* at any period of its existence.]

Three circumstances however were noticed which may have contributed to support the view generally taught.

1. The first is, that when the discharge comes from a part furnished with hair, as the leg for instance, minute accumulations of fluid form at the junction of the hair with the skin. These, I assume, are the so-called vesicles, and M. Devergie seems to be of this persuasion. But on more close examination it will be found that neither their course, situation, nor form, correspond with those of a true vesicle, and on touching one of them *gently* with a glass tube, a minute drop of serum is found to adhere. I have always failed to detect any trace of cuticle on these little drops of fluid; certainly if there were, the pressure was much too slight to break it, whereas we know that the covering of the vesicles will resist some force. When M. Devergie speaks of the fleeting nature of the vesicles of eczema, he overlooks the fact that genuine vesicles are not very fleeting even in such transient disorders as miliaria, and that those of herpes, with which he classes eczema, not only bear such distension as to become globular without bursting, but endure the friction of the clothes several days without rupture. Besides, however often herpes may reappear, it always does reappear in the form of vesicles, whereas I have never seen an outbreak of vesicles on a patch of eczema.

2. The second circumstance is, that in the vicinity of eczematous patches, vesicles, and even bullæ, are occasionally found; the former not unfrequently appear about the knuckles or back of the hand. These vesicles, however, last but a very short time, and in all the cases I have seen their return or reappearance was very uncertain, and not at all dependent upon the state of the eczema. Whether they arise from the irritation of the disorder itself, or from the use of ointments or lotions, could not be determined, as in general more than one of these exciting causes was in operation at the same time. These vesicles were always rare in proportion to the number of spots occupied by the eczema; that is to say, a patient with them might have

thirty or forty eczematous patches, and only one near which there were vesicles. They healed quickly, and did not become eczematous, and the disease in their immediate neighbourhood remained uninfluenced both by their outbreak and departure; sometimes appearing afterwards, in its usual form, on the very spot where they had shown themselves.

3. The third reason is that a disorder, which I consider a form of herpes, has been confounded with acute eczema. It begins with heat, severe itching and pungent stinging pains. Vivid red patches form, serum is effused under the cuticle, which is raised up in firm irregular vesicles, then the serum becomes of a whitish hue and grows turbid, the vesicles break, the fluid oozes out, the cuticle is next thrown off, leaving the skin red and tender, and the disease passes away mostly, I believe, to return no more. In still more severe cases numbers of little pustules form round about, and the irregular vesicles speedily grow turbid and break, forming really an impetiginous herpes. But except that the vesicles run into a mass instead of being separate, I see nothing that distinguishes this complaint from herpes zoster; it disappears almost, if not quite, as fast when nothing is done as when it is actively treated; the vesicles are firm and only break when the fluid has become turbid and flaky; at the end of two months' duration of the disorder in a chronic form, I have seen some of the vesicles still full of fluid.

The acute form of eczema is not very common, but its course and symptoms separate it readily from vesicular diseases, and ally it closely to an acute erythema or erysipelas, or that form of inflammation described by Mr. Wilson as the scalled head. In this affection a large portion of the skin, as the forehead for instance, becomes red, swelled, glazed, and stiff. This is followed by desquamation of the cuticle, and the formation of moist scales or even crusts, there may even be a slight though decided weeping, which is more frequently the case if it attack the leg. I once attended a gentleman who in the course of eighteen months had several attacks on the face, the whole surface of which generally suffered; but on no one occasion could either he or I detect vesicle. This form of eczema appears to me to form a pretty exact link between erysipelas and erythema.

Now the following appears to be the process which ensues in all cases of a truly eczematous nature. A portion of the skin becomes red, inflamed, and uneasy, stiff, and itching, but rarely swollen except when the complaint attacks the ear. The cuticle rapidly dies, and is cast off, or torn off by scratching. To this succeeds a discharge of serum which, judging from the appearance of the orifices whence it exudes, is poured out by the sudoriporous ducts. When the process is more slow, the falling of the cuticle is succeeded by a cuticle thicker and coarser in its

texture, and gradually assuming the look of a soft scale. For the most part the redness starts from several points or papulæ, which are neither so acuminated as those of lichen, nor so dark-coloured as those of prurigo, and which may rapidly, often within twelve hours, spread and coalesce into a patch. In some cases of old standing the eruption at a very early period, particularly when seated on the backs of the hands and wrists, presents the appearance of numerous minute, low, separate elevations of thickened red skin, partly denuded of all covering, and partly covered by discoloured but firmly attached cuticle, and sometimes indented so as to assume a cup-like form. For the most part, such spots when torn or rubbed, do not discharge serum by any means so abundantly as those beneath the thicker and moister flakes or crusts, which often pour it out in a surprising quantity.

I would venture to define eczema as a non-contagious inflammation of the papillæ of the skin, attended with increased nervous sensation in these parts, augmented and abnormal action of the perspiratory ducts, the contents of which often exhibit pus globules and plastic lymph, and increased secretion of very imperfectly formed epidermis, standing nearer to erythema and pityriasis than to herpes or impetigo, though capable of being complicated by both; divisible in its natural state into two great forms, the acute and chronic, between which it is not always easy to draw a clear and positive line of separation, instances, out of both divisions, of cure under the same form of treatment being numerous enough.

On the Treatment of Eczema.—[In the treatment of eczema it is not uncommon to find an author speaking of twenty or thirty powerful medicines—the use of many of which is quite superfluous. Tar, antimony, guiacum, and sulphur may be given up. Antiphlogistic treatment is injurious, as severe eczema never occurs without a certain feebleness of health.]

Cod liver oil is one of the most valuable remedies in eczema as in so many other diseases of the skin, and, perhaps, it would hardly be going to far too say that every chronic case is benefited by it, if taken long enough and in a proper way. Eczematous patients are generally very sensitive to cold, and means calculated to evoke heat seem to agree best with them. The dose should not be too large, never more than the stomach can bear comfortably; grown persons seldom require more than three or four tablespoonfuls daily; children bear relatively a much larger quantity, and may take, even when quite young, two to six teaspoonfuls or more daily. The great obstacle to its use, the nauseous taste, and the idea of swallowing a coarse animal oil, are oon overcome, and the result compensates the patient

for any disgust felt at the outset. Should the difficulty of taking it inwardly be insurmountable, as when it always brings on sickness, or when the patient is an infant at the breast, a broad fold of linen steeped daily in the oil, may be worn round the waist. The worst of this plan is that it makes such a filthy mess, and creates such an unpleasant smell, but it certainly does good, and children will get well and fat on oil used in this way.

On arsenic alone, it may be safely said, no reliance can be placed at any stage except the last, and not always then. Even Mr. Hunt, enthusiast as he is about the value of this mineral in lepra or lupus, has much less to say in favour of its power over eczema. It often proves of great service when the skin remains red and tender, with a quick reproduction of unhealthy cuticle or scabs, great itching, and a strong tendency in the disorder to stand still. This and this only, is the stage for which I would recommend it, and here I think arsenic is invaluable.

It may perhaps excite some scepticism when I state, that some of the patients who could not at first support the action of arsenic took it comparatively well after a course of tincture of steel. This was peculiarly the case with adults. I never saw it in children, who indeed bear arsenic very well. In my own case, five minim doses of the liquor arsenicalis soon brought on such irritation of the stomach, such nausea and purging, that I had to give it up at the risk of seeing the worst symptoms return. But after a good course of quinine and steel these doses induced no discomfort, except in the conjunctiva, and not much there. I believe however that this toleration of arsenic is quite artificial; after a respite of a few months from all medicines I have seen the same quantity of it produce the same effects.

Steel. I now come to the remedy which, in my hands, has proved of more advantage against the eczema of middle or advanced age than any other. I have already stated the circumstances which first of all led me to make trial of steel, and as they most probably would not interest the reader I omit them here. I had long felt, that as eczema has little tendency to bring on structural change, that as it is a disorder rather than a disease, the secret of its inveteracy lay rather in our not being able to find a suitable medicine than in the nature of the complaint, and the speedy removal of a most obstinate eczema by very simple means confirmed this view.

The patient was a shoemaker, suffering from eczema of the ankle, the skin of which was so tender and cracked that for long, even when it did not discharge, he had never been able to walk in any comfort. The itching tormented him incessantly, and having endured for years, bade fair to last as long as the patient himself. All the usual remedies were tried in this case, among

others tincture of cantharides and sulphur, and antimony in various forms. Tar also was given, first in pills and then in boluses, of which he swallowed a tolerably large stock, though they always occasioned a scalding sensation when at stool. Nitrate of silver, lead ointment, and nearly all the mercurial ointments were applied outwardly, but with so little effect that at the end of several months the patient disappeared, not only uncured but unrelieved. About half a year after I met him looking quite well, and learned that he had been quite cured by the use of Streatham mineral waters. He promised to send me a bottle of this water that I might have it analysed, but he failed to keep his word, and to this day I don't know what Streatham water is.

The observations and trials made upon the different preparations of iron have now been continued for several years, and after the usual amount of disappointment from losing sight of a patient just as some interesting case was drawing to a close, from conflicting evidence and conclusions disproved by later evidence, the following results were, I think I may say, pretty decisively established :—

1. It was found that the steel wine, carefully prepared and given in doses of one or two drachms two or three times daily, sufficed to remove most cases of eczema during the first year or two of life. It was, however, necessary to use the utmost care to ensure fresh air and proper food, as it is not always so easy to make people understand that invalids require these just as much as healthy persons do. The wine should be very carefully prepared, as I have tasted specimens of it so harsh that I do not wonder at its creating distaste in children. A very agreeable preparation is made by Messrs. Bell, of Oxford Street.

2. When children have passed this age, steel wine requires to be given in large doses to take any effect, and therefore becomes rather an expensive medicine, especially in hospital practice. Here the saccharine carbonate may be substituted, or the tincture of the muriate in doses of five to fifteen minims, well sweetened to suit the stomachs of these rather refractory patients, or the ethereal tincture also well sweetened may be used. The great point is to give the iron in a soluble form of tolerably pleasant taste and small bulk. If the sweetened carbonate be chosen, two to five grains may be ordered two or three times a day. These preparations of iron generally suffice with patients suffering from eczema up to the age of puberty; if however the bowels be confined a small quantity of mercury and chalk may be taken occasionally. This preparation is well suited for scrofulous children, it may be continued for a great length of time, it has the advantage of being tasteless, and does not interfere with the use of steel.

3. From this period (puberty) upwards more powerful remedies are called for, eczema being a more formidable affair at puberty than at childhood, and at manhood than at puberty. To balance this, however, the patients have now reached an age when, among girls particularly, the question of personal attraction is becoming one of the most important in life, so that there is seldom much difficulty in persuading them to swallow medicine somewhat less agreeable. I have generally found that these patients recover under the use of steel mixture in doses of two to four drachms two or three times a day. Perhaps owing to this being a very vigorous time of life, and to these patients being very favourably situated for getting fresh air and active exercise, eczema, so far as I have been able to judge, is neither so severe nor so refractory at this time of life.

4. In persons who had reached middle age or the decline of life, the tincture of the muriate of iron was often of great service, and the benefit was frequently so marked as to excite the notice of those who witnessed the employment of it; indeed, when properly aided by food, exercise, baths, and aperients, it may be safely said that few, if any, cases of eczema will, in the long run, resist its influence. It is however essential that it should be prepared not only according to the London pharmacopœia, but with such care as to ensure that no amount of free acid is present, which frequently preponderates to such an extent that the tincture cannot be given in the proper doses; indeed a good deal of the trash sold under the name of tincture is almost wholly composed of muriatic acid. When properly made a drachm or more may be given at a time, whereas half a drachm of the coarse acid tincture will set the teeth on edge and make the patient feel sick. I have often known a patient who was taking the pure tincture with benefit, turn quite ill after a dose of this stuff; several times severe vomiting has followed, and one gentleman was so sick and was purged so violently from taking two drachms of the common tincture that his family thought he had got the English cholera. This kind of thing has now happened so often that I always beg of patients, if they run short of the genuine tincture, rather to do without it for a day or two than get it from any source they are not certain about. The tincture of the perchloride of the British pharmacopœia is said to be a superior preparation, and I should think such was the case, but I have not had sufficient experience of its action to be able to decide.

The tincture must not only be given in pretty large doses, but it must be given for some time. It is of no use prescribing twenty or thirty drops for two or three weeks; as well not give it at all. It should be prescribed by the measured drop, and used for two or three months at least. Now and then the

patient may rest, if he have grown sick of his medicine, or suffer from dyspepsia, till the difficulty is set right again, but so soon as this is done the tincture should be resumed. If it cannot then be borne, as will sometimes happen with persons of feeble digestion, it should be abandoned in favour of some other preparation of steel, such as the ethereal tincture or Griffith's mixture.

When it is doing good the health often visibly improves under its use, the skin grows clearer and the muscles become firmer; while in some cases the face loses the careworn look it had acquired from long-continued ill health. At times, however, not only does this improvement cease without any evident cause, but a decided relapse will ensue even when the patient is taking the steel with every precaution. In this case there is no choice but to abandon it for a time and give some other tonic, such as quinine or cod liver oil. But it should be resumed as soon as possible, and continued till the moist state of the affected parts has quite passed away, and the dry stage been reached, when it may be given up for arsenic.

The objections to the tincture of steel are that it induces constipation and dyspepsia, and that patients get tired of the bulk of the dose and of constantly swallowing medicine.

The constipation may be easily remedied by the occasional use of the mild aperient pill previously spoken of; frequently it passes off spontaneously when the steel has been taken for a short time. The dyspepsia, the most frequent form of which is marked chiefly by coldness of the stomach and nausea, followed by some degree of griping and flatulence, is generally soon vanquished by leaving off the steel and giving some mild aromatic and antacid. There are so many of these, and their properties are so familiar to the reader, that I presume it will be quite unnecessary to specify them more minutely. To get over the aversion felt for the steel, the only plan is to give it up for a while; during this, if the patient feel very low, a short course of quinine or ammonia in infusion of cascarilla may be given; or, if the liver be sluggish, the nitro-muriatic acid in infusion of gentian.

I wish the reader, however, to understand that all these precautions are rarely required except in severe chronic or recurrent eczema; in the majority of cases, provided a soluble form of steel be given, and provided it sit lightly on the stomach, and do not interfere with the action of the bowels, I believe it does not so much matter what preparation of steel is used. At St. John's Hospital I have for long employed a simple solution in acid; a few pieces of iron perfectly clean and weighing two ounces, or, what is still better, the same weight of iron wire drawn by the magnet, are dropped into a pint of strong muriatic

acid of 1160 specific gravity; at the end of a few days a very saturated solution is formed, which is made up for use, and of this ten to fifteen minims are given twice or thrice a day to an adult. This preparation answers very well, but, if the reader know a better, by all means let him keep to it, in the full belief that from his favourite prescription he will obtain all the good he might expect from the one I have spoken of; what is more, if he give it properly, he may feel confident that he will always do a certain amount of good in eczema, and if the patient's system should not answer to the helm, then, I think, he may rely upon it that a suitable time for giving steel has not been chosen, and that no preparation of it is likely for the moment to be of service. Such, at any rate, are the conclusions which, I think, my notes warrant me in drawing.

Supposing, however, that steel has been given, and that the patient has not improved as the surgeon could wish, what is the proper step to take? Decidedly, I should say, give cod-liver oil and arsenic. But if even after a course of these eczema, though much better, be not quite cured and wear an aspect that unmistakeably threatens a relapse, what should be done? Shall we send the patient for change of air, or give tar, cantharides, and mineral waters? I reply, that forty-nine patients out of fifty cannot get change of air; and as to the Spanish fly, tar, &c., I believe that their virtues, if they possess any, are powerless against these inveterate cases, and they are by no means imaginary ones.

I believe that no good whatever is likely to come in such a dilemma of again using medicines already tried in larger doses and fresh combinations. The antidote for this relentless nuisance is, not a remedy, but a course of treatment which will give it no rest; success is only to be secured by watching each step of this course, and whenever the power of any part of our treatment begins to flag, then in going further, but further only in a prescribed and foreseen direction.

At this stage the mercury comes to our help, and a short course of it now will often be productive of very good effects. I have, however, so far only seen this action manifested by two salts of mercury, namely the biniodide and the bichloride. I scarcely know which is the more powerful of the two, but, on the whole, I think the bichloride is, and Mr. Startin seems to have had great success with it. About an eighth to a sixth of of a grain of either will generally prove sufficient for a dose, which may be given once, twice, or thrice a day, according to the severity of the complaint or the age of the patient. I have given young boys and girls a sixth of a grain daily with the best consequences. The mercury may be ordered with a sedative and aromatic to prevent griping, perhaps two or three grains of

extract of lettuce, with a strong essential oil, as of cassia or peppermint, will serve this end as well as anything. When much pain of any kind complicates eczema, or when there is a tendency to diarrhœa, a quarter of a grain of pure opium may be added. If the form of a pill be objected to, the bichloride may be given in tincture of cinchona, a grain in each ounce; the biniodide can be prescribed in solution by mixing bichloride of mercury and iodide of potassium. After a short course of either of these salts, the arsenic may be resumed with the best prospect of success.

Mr. Wilson's treatment of eczema rubrum is first to put in force antiphlogistic treatment, and follow this up by the use of nitro-muriatic acid in bitter infusion. The external means which he employs at first are lead lotion, with the addition of a little spirit, and when the acute stage has passed away, he prescribes the oxide of zinc ointment mixed with liquor plumbi; this he follows up by the nitrate of mercury ointment, diluted with an equal quantity of simple cerate. For chronic eczema his remedies are bitters and alkalies, accompanied by gentle aperients and alteratives, to which succeed five minim doses of Fowler's solution given three times a day. Locally he uses here the benzoated zinc ointment with rectified spirit, a drachm to the ounce, and after this directs the patient to rub in the nitric oxide of mercury ointment diluted with spermaceti ointment, in the proportion of two-thirds of the latter to one of the former. It is well known how successful Mr. Wilson is in his treatment.

Mr. Startin's treatment of eczema is much the same as that for impetigo, and which the reader will find in the section devoted to that complaint; and that he relies very much on baths, using vapour baths, daily tepid ablutions with yolk of egg, mucilage or bran water; he places great confidence in the bisulphuret of mercury in ointment, and for children when there is great irritation a mixture of Goulard's liquor and cream.

External Applications in Eczema.—In acute or slight eczema almost any mild astringent, especially if it possess some amount of soothing power, will suffice. Oxide of bismuth in elder-flower water or camphor mixture, a drachm to eight ounces, or the liquor of the diacetate of lead in the same fluids and the same proportions, form a useful lotion. When expense is not an object, half an ounce of glycerine should be added, as from its faculty of retaining moisture it powerfully aids the purpose lotions are intended to serve. When there is a large weeping surface, especially if of long standing, the reader may try Dr. Hughes Bennett's plan. It consists in applying a solution of carbonate of soda, half a drachm to a drachm in eight or ten ounces of water, by means of a piece of lint soaked in the solu-

tion and laid on the part; it must be covered with thin gutta percha to prevent its getting dry, or else be entrusted to the care of some person who will see that it is kept moist, for which purpose the lint may be simply sprinkled continuously with cold water, the lotion being only occasionally applied. If this plan be properly carried out, if the lint be kept wet all day long (and all night too, if possible) the effects are often marvellous; but if it gets dry the soda soon irritates the surface; the addition of glycerine, half an ounce to the eight ounces, will mitigate this to a certain extent, but nothing compensates for want of attention. Dr. Wallace has reported some cases in which the excellent results of this plan were very marked indeed, but the reader will not fail to observe that one of the very instances in which its action was at first so manifest is reported at the close as "almost cured." My experience of it is that, though it gives great relief, yet that it has very little curative power; that it is only suitable for a large wet surface, and that it is apt in eczema of the head to give a bad cold.

In chronic eczema, if the surface be much inflamed, a lead lotion may be applied at first, or the solution of soda as above stated. So soon as the discharge and inflammation are checked, Mr. Wilson's zinc ointment forms an admirable dressing; it is rubbed down with spirit and smeared like cream on the part. When once ointments are begun with there should be no more water used, except when eczema is discharging freely from the head, as happens especially in children. At such times the ointment, if applied too freely, causes the discharge to be retained under the crusts; a white bread poultice and then a daily washing with yolk of egg will soon remove this, and the ointment can be resumed. It is a good plan to use some means for preventing the ointment from being rubbed off, and protecting the tender surface which it covers from friction against worsted flannel or cloth. To this end the surface can be covered with linen or tissue paper. When eczema has reached the dry stage, the ammonio-chloride of mercury is a very useful application, and for an efficient preparation is perhaps the cleanest and freest from smell of any we have; but in point of efficacy, I would place it decidedly below the dilute nitrate of mercury ointment, which is the most valuable preparation at this stage of any that I am acquainted with, and, to my thinking, superior even to the red precipitate ointment, in which, however, Mr. Wilson places great faith. It is absolutely necessary that it should be fresh made, and a small quantity of olive oil should be added to render it rather fluid. If the eruption be seated on the head, the hair should be cut off in children and the ointment applied night and morning. But grown persons cannot, or will not, always submit to this; and here I would suggest the use of

chloride of zinc for a few days. The head is washed daily with hot water and yolk of egg, then with clean hot water, and after this the affected parts are bathed with solution of chloride of zinc, a grain or two to the ounce, a little creosote or gum acacia being added. After this the ointment may be begun with ; the hair should be parted, any crusts gently detached, and the ointment lightly rubbed in. Some persons with a strong tendency to eczema, or after the cure of the worst part of their complaint, suffer a good deal from a chapped, red, and tender state of the skin. Cold cream is often very effectual, or the patient when going out may dust the surface over with rice powder, to which a small quantity of camphor and oxide of zinc has been added. When the hair is falling from eczema, I know of no remedy so effectual as cutting it quite short and blistering the skin as for alopecia.

The preparations of tar, creosote, &c., seem to merit special consideration; nearly every writer recommends them, and I believe few use them. In creosote I confess at once I have very little faith; I never saw any particular benefit from it in any skin disease. Tar makes such a filthy mess that I doubt if it will ever come into general use, and how Hebra can get his private patients to rub in a mixture of tar and cod-liver oil, quite passes my comprehension.

To relieve the itching of eczema, Mr. Wilson recommends juniper tar ointment, as also emulsion of bitter almonds with prussic acid; but I believe the only effectual remedy for the itching is the cure of eczema, and this holds good of another disagreeable symptom spoken of by Mr. Wilson, a kind of neuralgia or rheumatism of the skin, which I have certainly seen, though very rarely. Mr. Wilson says he has found no remedy for it equal to a solution of nitrate of silver, a grain in an ounce of spirit of nitric ether.

People say ointments are barbarous and apt to become rancid. But a remedy which promotes the patient's comfort and a cure of the disease, cannot, in fairness, be called by so hard a name; and when an ointment is rancid, either there has been great neglect or bad materials have been used. Mr. Wilson relates, that having been consulted by the surgeon of a London hospital, he ordered him zinc ointment, which the surgeon procured from his own hospital; Mr. Wilson, curious to know what a hospital's idea of zinc ointment might be, asked to be favoured with a view of a specimen, which he found to be composed of a material much more fitted for greasing wheels than for applying to the human skin.

This neglect is all the more unpardonable, because very simple means will secure efficiency. Thoroughly purified lard only should be used, and this is only to be had by paying a higher

price than usual; the addition to each ounce of lard of ten grains of gum benjamin will prevent any rancidity. The pure gum or tears should be selected, these are broken up and digested in the lard for forty-eight hours. This mixture is afterwards strained, and then the active ingredient is added. For zinc ointment the oxide is used, and Mr. Wilson prefers the buff-coloured oxide of the pharmacopœia to the white oxide made by combustion. I think, however, anything to be used for either the hands, head, or face can scarcely be too free from colour, and as the white oxide can now be had very pure, I decidedly prefer it.

I appeal to the experience of the best authorities in these diseases, whether ointments do not agree better than lotions or any other applications. It is well known that for many years both Mr. Wilson and Mr. Startin have devoted the greatest care to this specialty, and they both use ointments freely. But the reader has only to apply them properly in order to satisfy himself that in eczema and some other affections they not only exert a decided action over the disease, but that they form the most perfect defence against the irritation which the contact of air with the diseased surface is apt to set up; a point of no slight importance if the whether be raw, or very dry and cold. Mr. Wilson thinks they prevent the great oxygenation of the blood, which is apt to occur in inflammation of the skin. They cannot be too sedulously employed in eczema; even when in the house the face, if affected, should be covered with oxide of zinc ointment, white precipitate ointment, or cold cream; if the hands be affected the patient should avert the rubbing off of the ointment by wearing gloves with the tips of the fingers cut off. —*Milton on Skin diseases, p.* 27—58.

59.—ON THE TREATMENT OF PSORIASIS AND LEPRA.

By Dr. T. M'Call Anderson, Physician to the Dispensary for Skin Diseases, &c., Glasgow.

[Although as a rule the constitutions of patients suffering from psoriasis are sound, yet their health is generally for the time being, below par. In the treatment attention must always be directed to this point. Many so-called alteratives have been used.]

In prescribing a course of *constitutional* treatment, the fact must be borne in mind that, as far as we yet know, there is no medicine which is capable of eradicating the predisposition to the disease, and that our efforts must be directed towards the removal of the exciting causes. Before subjecting our patients, therefore, to a course of alterative treatment, it is necessary to

find out, if possible, the exciting causes, and to endeavour to remove them. Thus, one man, predisposed to psoriasis, may lead a very sedentary life, be much harrassed by business, and his mind be constantly on the rack. He takes his meals at irregular intervals and sleeps badly. His digestive and nervous systems are deranged, and out comes his enemy. It would be injudicious in most cases to subject this man to a course of alterative treatment, in the first instance; but we make him give up business for a time; we send him away for change of air—we shall say to Harrogate, if it is the season and there is plenty of cheerful society, for this has a very beneficial effect upon such cases. The torpidity of his digestive organs is corrected by a judicious course of Harrogate waters, or, what is nearly as effectual, by the administration of some aperient medicine in the shape of cream of tartar and sulphur, or a pill containing a little calomel; he gets plenty of fresh air, he takes his meals at regular hours, goes early to bed, rises early in the morning, and has nothing to harrass or worry him. It is wonderful, after a few weeks, in what a different state of health he returns. In some cases the eruption has disappeared or is fading; but if not, it is then time to prescribe an alterative medicine, such as arsenic.

Wilson cites a similar case, that of a surgeon who was affected with lepra complicated with debility and malassimilation, and which was removed by the mere administration of a course of nitro-muriatic acid and gentian.

In fact, we shall generally find, if we examine our patients carefully, that though, as a rule, their constitutions are sound, the eruption has been called forth in consequence of their health being below par; and this we must always, in the first place, endeavour to correct. In doing this we must be guided by general principles. If we have succeeded, and the eruption persist notwithstanding, we must then make use of the so-called alteratives.

Those which are much used, and which are in my opinion useless, are tincture of cantharides, decoction of dulcamara, balsam of copavia, oil of turpentine, tar water, and tar pills. Those which I have found of service are arsenic, cod liver oil and alkalies.

The use of arsenic in the treatment of psoriasis is so well known, and so thoroughly appreciated by those who have had much experience of it, that it is unnecessary for me to dwell upon it. Fowler's solution is the preparation which I am most in the habit of using, and I do not think that any other form of arsenic has a more beneficial effect. It may be given to a child of seven years of age in doses of two or three drops, to an adult of five or six thrice daily after food. It agrees better with the

stomach if it be given in a bitter infusion—as infusion of cascarilla or gentian, in doses of a drachm to half an ounce. The patient should be warned to be careful of catching cold while using it, to take a nourishing but unstimulating diet, and to attend to the state of his bowels. Every three or four days the dose should be increased by a drop, till the disease begins to yield or till the medicine disagrees. I am convinced that arsenic would be found much more serviceable if physicians would continue it steadily for months, and not to be induced to stop it without some very pressing reason. In some cases asiatic pills may be used instead of Fowler's solution ; namely, when the patient prefers pills, and when one wishes to conceal from him what he is taking, for Fowler's solution is well known to the public to be a preparation of arsenic.

There can be no doubt that arsenic is the most valuable internal medicine which we possess in the treatment of psoriasis, and that few cases, in which it is patiently and perseveringly employed, altogether resist it, while in many instances the eruption completely vanishes. The more recent the eruption, the more readily it is acted upon by arsenic, while chronic cases to which there have been many relapses are sometimes very rebellious.

Next in efficacy to arsenic in the internal treatment of psoriasis, though applicable to a different class of cases, comes cod liver oil. By the majority of dermatologists this medicine is not even hinted at as serviceable in this complaint, while Hebra of Vienna only mentions it in order to state that it is useless. There are many cases, however, which are greatly benefited by it. In those rare cases in which the eruption appears instrumous persons, there can be no doubt theoretically that cod liver oil should be used, while I have myself had practical demonstration of its value. If my readers will refer to my remarks on the causes of psoriasis, they will there find the account of a remarkable case of very extensive and oldstanding disease occurring in a hunch-back, where cod liver oil dissipated the eruption almost entirely in six weeks.

But there is a far more extensive class of cases, those, namely, in which the patient, though constitutionally sound, is debilitated either by previous disease, insufficient diet, over-lactation, or the like, in which cod liver oil has in my hands proved of great service. And I would go further even than this; for I am of opinion—one which is not yet, however, sufficiently strengthened by examples to be stated as a fact, that many cases of old standing, in which other remedies have been tried unsuccessfully, and in which the patients to be neither debilitated nor strumous, are benefited by cod liver oil.

The finest pale oil is the preparation which I prefer, of which

a teaspoonful may be given to an adult thrice daily at first, and the dose gradually increased till four tablespoonfuls are taken per diem. It is most likely to agree if taken after fond ; but many who are accustomed to take it, and with whom it agrees well, should take it in the middle of the interval between each meal, when it may be looked upon in the light of a supplemental meal.

On no account should the patient be allowed to stop it for a slight reason ; and often on inquiry it will be found, that when it is said to disagree with the stomach, it in reality agrees quite well, but is disagreeable to the taste. Even if the patient loses his appetite or is sickened with it, it should not be omitted entirely, but only for a few days, and then given at first in a smaller dose and immediately after food. If the fine pale oil disagree, one of the other varieties may be tried, or "Furley's cod liver oil cream." or cod liver oil chocolate, made by M. Lebaigue, 9, Langham Place, introduced by Erasmas Wilson. Each pound of the chocolate contains four ounces of oil. Sometimes the addition of a little syrup of the iodide of iron (say ℥ss. to each dose) to the pale oil renders it more palatable, and is besides of value in the case of debilitated or strumous patients.

Very successful results may often be obtained, in cases where one is in doubt whether cod liver oil or arsenic is indicated by combining the two.

Alkalies are not nearly so generally applicable to the treatment of psoriasis as arsenic or even cod liver oil. They are chiefly used when there is a gouty or rheumatic taint, or when the patient is much addicted to the use of stimulants, and when there is a tendency to acidity of the stomach, and to the deposit of lithates in the urine. The indications, indeed, for the use of alkalies in eczema and psoriasis are nearly the same.

The alkali most used and greatly praised by Dr. A. T. Thomson, the late Dr. Joseph Bell, who published a series of cases of psoriasis which were benefited by it, and others, is liquor potassæ, which is given in doses of 20 to 30 drops thrice daily in a large quantity of water, or, as the late Dr. Neligan recommended, in table beer or veal broth. Dr. Easton, of Glasgow, says he has found much benefit from the use of the acetate of potash—which is, however, not an alkaline but a neutral salt—in doses of ℥ss. thrice daily.

The carbonate of ammonia is the alkali from which I have myself derived most benefit. It must be made up in small quantities and kept in a well-stoppered bottle, as it loses strength rapidly when exposed to the air ; and the apothecary must be warned to give an article of full strength, and one which has been carefully prepared. It should be given in doses of ten grains gradually increased up to 30 or 40, and largely

diluted with water. Sometimes it will be found of service to combine it with a preparation of arsenic, or with colchicum if there be a gouty tendency. The latter may be added in doses of about 10 drops.

In persons addicted to the use of ardent spirits, the eruption is apt to appear in a very aggravated form, and I have seen it very rapidly improved by a course of carbonate of ammonia. In nervous persons, whose nervous system has been acted on by some depressing cause, a course of carbonate of ammonia often benefits the eruption, especially when combined with change of air and scene, and cheerful society.

But we shall suppose that the eruption is chronic at the commencement, or that, by means of one or other of the above methods of treatment, the acutely inflammatory symptoms have subsided and the eruption remains stationary, what are we to do now?

In the first place, we must remove the scales; and this is done by means of warm baths, or by the hydropathic treatment, and thorough rubbing with rough towels after each; or by taking two or three Turkish baths, with thorough shampooing. This having been done, and the morbid surfaces being fully exposed, we proceed to the application of local stimulants and alteratives.

If the eruption be extensive, there is no class of remedies so generally useful as preparations of tar. Of these some prefer the common tar (Pix liquida), others the oil of cade (Oleum cadini, manufactured at Aix-la-Chapelle), or Oleum rusci (obtained from the bark of the white birch, and a supply of which has recently been obtained from Germany for me), while the mixture which I have alluded to in my book on Eczema under the name of "Tinctura saponis viridis cum pice" is frequently of service. Whichever of these is used, it should be rubbed firmly into the eruption, and the application repeated night and morning, after the previous one has been washed off with soap and tepid water. During the treatment by means of tarry or unctuous applications to a large extent of surface, the patient should be made to wear a woollen dress next the skin; and he should be warned not to change it oftener than once a fortnight, as a dress impregnated with the application keeps the skin in an atmosphere of it, and is beneficial.

Sometimes the application of tar is not well borne, and I have known a single application greatly aggravate the inflammation of the skin, producing a severe dermatitis; and the unfortunate circumstance is, that one is often unable to tell beforehand in what case it is likely to occur. For this reason it is generally better to begin the tar treatment cautiously, and to use at first a diluted preparation in preference to the pure tar. The incor-

poration of tar with an ointment is a very good way of diluting it, rendering it more agreeable to the patient, and less likely to excite inflammation. It may be incorporated in varying proportions with zinc ointment, or with a mixture of powdered oxide of zinc and almond oil ;* or the common tar ointment may be used with benefit, although I am surprised to find that it has been omitted from the British Pharmacopœia. Those who are familiar with the use of tarry preparations in the treatment of eczema, and of the great benefit which is derived from them in chronic cases, will be much disappointed at first to observe that eruptions of psoriasis are very much less under their influence, and that they act very much more slowly upon the latter. I was particularly struck by this in a case of psoriasis of the elbows, combined with eczema of other parts. I ordered the "tinctura saponis viridis cum pice" to be rubbed upon both eruptions twice daily, and in a few days the eczema had all but disappeared, while very little impression had been made upon the psoriasis. My object in mentioning this is, not to undervalue preparations of tar in the treatment of the latter, but only to warn those who are making use of them that, as a rule, they require to be persevered with for a much longer time than in cases of eczema.

It is well to know that when tar is rubbed upon the skin it is to a certain extent absorbed, and circulates through the body ; so that when a large extent of surface is under treatment, and particularly if the tar be rubbed very firmly into the skin, disagreeable symptoms may be induced, such as nausea, vomiting, diarrhœa, and feverish symptoms. The matters vomited, the stools, and the urine have a green or black appearance, owing to the presence of the colouring matter of the tar. These symptoms, however, rapidly subside if the treatment be omitted for a few days, and a diuretic given to cause increased excretion of tar through the kidneys.

Tarry preparations are not so convenient to apply to the head, owing to their glueing the hairs together ; or to the face, owing to the discolouration and consequent disfigurement which they produce. I am therefore in the habit of applying to these parts one or other of the lotions or ointments which I am about to mention, and of only using preparations of tar when the others fail or when the inconveniences just alluded to are of no consequence.

One of the best applications—one which I have used with great advantage, and which is much employed and justly praised by Hebra—is soft soap (potash soap, black soap, sapo mollis),

* R. Olei cadini (Aix-la-Chapelle) ʒvi.: ung. simplicis, pulv. oxidi zinci, olei amygdalarum, aa ʒi.; cochinillini gr. iv.; olei rosæ m. xviii. M.

or what is better, a solution of it in water* or spirit.† These require to be rubbed into the roots of the hair and on the spots on the face very firmly every night, or, if convenient, every night and morning, and washed off as seldom as possible. I have noticed, an observation which was first made by Hebra, that the eruption of psoriasis on the head and face is much more readily removed by local measures than when it is situated on other parts, and that the above treatment invariably removes the eruption from the head in a comparatively short time.

Hebra recommends the following modification of Pfeuffer's treatment in cases of extensive eruption ; but I have not used it often myself, owing to the pain which it produces, and the necessity of confining the patient to bed. This consists in rubbing soft soap into the whole of the eruption twice daily for six or eight days, each patch being once rubbed, during that period, so hard as to remove the scales entirely and cause slight bleeding. The patient lies in bed all this time enveloped in blankets, and for three or four days after it. He then takes a warm bath and dresses himself. Hebra remarks with regard to this treatment that it is only successful in the minority of cases, that it often requires to be repeated, and that it may be combined with one of the other methods of local treatment with advantage.

Ointments containing mercury are often of great value ; but they are more applicable to the treatment of limited eruptions, as it would be unsafe to apply them for any length of time to an extensive surface, owing to the danger of their being to any great extent absorbed, thereby producing salivation—an occurrence which is not only to be avoided for its own sake, but which has the additional disadvantage of tending to produce a more copious eruption, owing to the depression of the general health which is thereby induced. There is no reason, however, why, in extensive eruptions, one of these ointments should not be applied to certain parts, such as the head, face, or hands, while other methods of local treatment are employed for the other parts which are affected. Those which are most useful are, citrine ointment (Unguentum hydrargyri nitratis), white precipitate ointment (Unguentum hydrargyri ammoniati), ointment of the red oxide of mercury (Unguentum hydrargyri oxidi rubri), and ointment of the red iodide of mercury (Unguentum hydrargyri iodidi rubri). These must be rubbed into the eruption, after the scales have been removed, night and morning.

* ℞. Saponis mollis ℥i.; aquæ bullientis ℥ii.; olei citronellæ ʒss. Solve et cola per chartam.

† ℞. Saponis mollis ℥ii.; spiritus rectificati ℥i.; sp. lavandulæ ʒi. Solve et cola per chartam.

It is of great importance to use a very small quantity of ointment, to melt it completely before using it, and to rub it in very firmly. Great care must be taken to obtain an ointment which has been recently and properly made, and to get it in small quantities, so that it has no chance of becoming rancid by too long keeping. And one must be constantly on the watch for symptoms of salivation, especially when it is remembered that the amount which, when absorbed, is capable of producing them, varies much in different persons.

For limited eruptions, Hebra recommends the use of Vleminckz' solution of sulphuret of calcium, a preparation which I have recommended in my work on the "Parasitic Affections of the Skin" for the cure of scabies. It should be rubbed into each patch firmly with a piece of flannel till slight bleeding is induced, when a little more of the lotion is laid on, and it is allowed to dry. The patient then sits in a warm bath for about an hour. The parts are then washed and dried, and a little oil is applied. One good rubbing generally destroys a patch of psoriasis, but the treatment is very painful.

When the eruption is very limited it may be removed by blistering. For this purpose collodium vesicans (Neligan) or glacial acetum cantharidis—that is acetum cantharidis prepared with glacial acetic acid, the ordinary solution of the Pharmacopœia being two weak—may be used. It should be made in small quantities at a time, and kept in a good stoppered bottle, the stopper being removed for as short a time as possible; and, when not in use, covered with leather, otherwise its strength soon diminishes, and much annoyance is thereby occasioned. A little of this solution should be taken up by means of a paint-brush, and painted firmly over the part till it becomes perfectly white. If the fluid is full of strength, and the skin thin, as on the face, it usually blisters it at once; but if the opposite holds, and especially if the head or palms of the hands are to be blistered, it may require to be painted over them for several minutes. When the skin is *thoroughly whitened*, enough has been applied; but it must be remembered that the skin rarely "rises" after it, as after the application of a common blister. One application is often sufficient to remove the patch.

The eruption on the hands or other parts may often be benefited by what may be termed "localised cold packing." This is done by wringing a handkerchief out of cold water, and rolling it firmly round the parts, and then covering it completely with oilskin. This is done every night, and the application is allowed to remain on till morning. In a short time the eruption is modified, and in some cases it disappears altogether; but if not, it is then of advantage to make use of one or other of the ointments above referred to.

If the eruption does not yield to medicine at home, a course of mineral baths is to be recommended, especially if the disease is of old standing, and the patient in need of change of air, and relaxation from business. Those of which I have had most experience are Leuk, Aix-la-Chappelle, and Kreuznach. The last two are the most agreeable residences for visitors, while the baths of Leuk are probably the most effectual. It is generally of advantage to go for two or three summers in succession to one or other of these places, remaining three or four weeks each time ; and frequently the benefit derived is not experienced till some time after the course has been taken. It is a common opinion that the advantage derived is due, not so much to the ingredients in the baths, as to the maceration which the skin undergoes, owing to the prolonged immersion in hot water, an opinion which is probably correct.—*Glasgow Medical Journal, July* 1865, *p.* 144.

60.—ON THE TREATMENT OF ACNE.

By J. L. Milton, Esq., Surgeon to St. John's Hospital for Skin Diseases.

My own experience is, that in acne there is only one medicine really necessary, and that is arsenic; all the others only clear the way for it. When there is any great feeling of heat and irritation, white tongue, irritability of the stomach, tendency to vomiting and constipation, it is generally necessary to give a mild saline aperient for a few days before beginning with the arsenic. Similarly, when arsenic brings on headache, sickness, coating of the tongue, and nausea, it is as well, if these symptoms do not soon begin to yield again, to leave off the medicine and give the saline. Again, if there be loss of appetite, a mineral acid may be prescribed in bitter infusion; and perhaps few preparations of this kind are superior to the nitric or nitro-muriatic acid in infusion of quassia or calumba. Suppose, however, that loss of appetite is conjoined with acidity of the stomach, foulness of the tongue, and constipation, then liquor potassæ may be substituted for the nitric acid, and mild aperients may be added; if there be no particular loss of appetite, the liquor potassæ may be given in milk, particularly if there be much thickening of the skin. I believe my observations quite warrant me in saying that, even when given alone, it will, after a time, produce considerable absorption of the matter around the follicles, making the skin much thinner and softer, sometimes also paler. In this respect it paves the way exceedingly well for arsenic; but I have never

been able to cure one severe case of acne with it, however carefully it might be used, and with whatever amount of perseverance.

If the bowels become constipated at any time while these medicines are being taken, the necessity for attending to this state should, I think, take precedence over all other indications for treatment, especially if the patient have any tendency to piles, as is sometimes the case in bad acne rosacea. The simpler, however, the aperients which are used the better: they need not in any way interfere with the employment of other remedies, and may be continued even when the arsenic has been begun with; though generally they are not requisite then, because the arsenic itself rather tends to bring on looseness. When aperients are not necessary, small doses of mercury may be given, especially if there be any objection to the use of arsenic, to the employment of which some practitioners are very averse; but I do not think mercury should be given either to overcome constipation or along with aperients, as it is apt to distress patients. Perhaps no salt of mercury fulfils the requisite indications here better than the biniodide, in doses of a sixth of a grain or so daily, in combination with some mild sedative or aromatic; but I think that its administration had better not be continued after the arsenic has been begun with. Should there be much exhaustion, steel may be given; and it has more than once happened to me to protract the cure rather than hasten it, by hurrying on to the use of arsenic before putting the patient through a course of steel, the necessity for giving it being shown by the immediate benefit which ensued so soon as it was had recourse to. When there is no dyspepsia present, the tincture of the sesquichloride of the British Pharmacopœia, or some similar preparation may be exhibited; and when these disagree with the patient, the steel mixture of the Pharmacopœia sulphate of iron, either with or without sulphate of quinine, may be substituted.

So soon as these remedies have even partially fulfilled the indications expected from them, not a day need be lost in giving the arsenic; it is not in any way necessary to get over every little disturbance of the system before using it, partly because the beneficial effect of the tonics, &c., to some extent continues after they have been given up, and partly because arsenic is a powerful tonic, keeps the bowels open, and removes many obstinate nervous symptoms. When it is beginning to produce a decided effect upon the disease, it may be advisable, and indeed it is sometimes necessary, to reduce the dose; but this should only be done when absolutely requisite, as it cannot be raised again so easily. Should a relapse occur, I think it is decidedly preferable, instead of increasing the dose, to give the

saline, and acid, or steel, for a short time, after which the arsenic can be given in the same quantity as at first.

As to external applications, I confine myself to saying that I have tried several, and that, with a few rare exceptions, I think they may be dispensed with, and that they exert no material influence over the duration of severe acne. Any mild mercurial preparation, such as calomel ointment, seems to agree very well with punctiform, or simple inflamed acne, and the ointment of the hypochloride of sulphur is a valuable preparation in the more severe forms, and in acne rosacea. I have removed a considerable degree of rosacea by simply employing this remedy freely every night. Blistering with nitric acid or cantharides has been recommended on excellent authority, but I have never found it requisite to employ so sharp a remedy. Lotions and washes of all kinds are, I think, superfluous. They may be admitted as luxuries, but such things divert attention from the more important subject of medical treatment; and when the precaution is taken of always washing with very hot water, without soap, of using ointment freely every night, and defending the face from the action of cold dry winds, they are very rarely required.

I will now give a few cases recently treated in this way. If they establish the conviction in the reader's mind that they are adequate to the purpose, the object aimed at in this paper will be gained; for my wish is simply to call attention to the benefits of a plan which may enable us to get rid of unnecessary elements, seeing that the nature and uses of one drug can be much more easily learned and retained in the memory than those of several, and offer a more easy standard of comparison with any new remedy we may be tempted to try.

Case 1.—*Acne Rosacea of long standing.*—A. G., a strong, otherwise healthy-looking man, applied as out-patient at St. John's Hospital, October 13, 1863, with this affection, under which he had been suffering several years. The skin over almost every portion of the face was raised up in large papules of intense redness; there was no lividity in them, the colour being a deep rose, or damask. They also extended over a great part of the front of the chest, particularly along the line of the clavicles. The skin in the few parts of the face not assailed by the acne was, I think, without exception, the coarsest I ever saw; it was almost like a grater, with the colour of a nutmeg or old lemon. The patient suffered from acidity of the stomach and heartburn, accompanied, and as he thought, aggravated, by constipation. He was directed to take twenty minims of liquor potassæ three times a day, and an occasional aperient, to wash only with very hot water, avoiding the use of soap, and not to take any hashes, stews, pork, &c., the use of which was gene-

rally followed by an exacerbation of the heartburn and acid eructations.

His employment only allowed him to come very seldom, and it was not till March that I could secure his regular attendance. The arsenical solution was now added, in doses of five minims three times a day; but it almost immediately produced such disorder of the stomach, that it had to be given up, and steel was prescribed instead, a saline being first of all given, in order to allay the irritability of the stomach and remove the coated state of the tongue induced by the arsenic. Some slight improvement took place under this treatment; he remained free from indigestion and costiveness; but as he did not attend very regularly, he made no great progress till July, when, having arranged to come once a week, the arsenic was resumed in the same doses as when first used, the ointment of the hypochloride of sulphur being added. He now attended very punctually, and so far as I could gather from his own statement, suffered no inconvenience from taking the arsenic, beyond now and then a slight feeling of sickness, which, however, was not severe enough to induce him to leave off the medicine; and the beneficial action of this was now so steady and rapid, that by the end of September the disease had almost entirely disappeared, and on the 24th of November, when he was last seen, it was gone, the cure being to the best of my judgment complete.

Case 2.—Acne Rosacea of nearly Nine Years' Duration.—G. R., a strong-made man, aged 35, a waiter by trade, was admitted December 5th, 1865, as out-patient at St. John's Hospital, with this complaint. His account was that, nearly nine years ago, he noticed it after long and wearying debility and lassitude. It first appeared on the cheeks, and gradually spread to the forehead. The face is now almost entirely covered with hard, fiery, red papules, several of which are in a state of suppuration, and the intervening skin, except in one or two small spots, is of the same fiery hue. The face is a good deal pitted, from the suppurating of the follicles. He denies having been irregular in his habits, though he may have, he says, on a few rare occasions, given way to intemperance. He has been under treatment, and has also attempted to cure himself. I need scarcely add that, while he was his own physician, he took a quantity of cooling medicine and sarsaparilla, both with the same amount of benefit.

He was ordered a dose of the saline mixture of the hospital every morning, and to wash only with very hot water. Having continued this treatment for a week, the dilute nitric acid was prescribed in infusion of quassia, three drachms of the acid to a pint of the infusion; an ounce three times a day. He was directed to take plain good food, and a little pale ale or dry sherry

as a stimulant. As generally happens under this treatment, the tongue rapidly became clean and the appetite improved. The ground being thus cleared, he was, on the 19th, ordered the liquor arsenicalis, without spirit of lavender, five minims three times a day with his food; he was also directed to apply the ointment of the hypochloride of sulphur to the face freely on going to bed, and to allow it to remain on all night.

By the 13th of February the disease, though somewhat retarded by a slight outbreak of indulgence shortly after Christmas, which required a return, for a short time, to the nitric acid and quassia, was quelled; the suppuration had long ceased; the tubercules had flattened down almost to a level with the skin, and the fiery hue had given way to a slight amount of deepish redness. He had only taken the arsenical solution twice a day during a greater part of the time. He continued to progress in a very satisfactory manner till the beginning of March, when he was suddenly assailed by a severe looseness of the bowels; believing this to be the effect of the medicine (the arsenic), he left it off, and as he seemed afraid to resume it I directed him for a few days to use only the ointment. About the middle of the month there seemed to be a strong tendency to relapse, owing, perhaps, in great part to the extremely bleak east winds which prevailed at that time; but this outbreak subsided again under the continued use of the ointment, and when seen on the 27th he was, for all practical purposes cured, the spots being quite shrunk, and differing only a very little in colour from the surrounding skin.

Case 3.—*Acne Rosacea of Twenty Years' Standing.*—Anne S., an unmarried woman, came under my care, as a private patient, on January 3rd, 1863, with this affection, which she attributed to anxiety; it was very severe, the skin thick and deep red. She was ordered the dilute nitric acid in infusion of quassia, the eighth of a grain of biniodide of mercury daily, and a lotion of the carbonate of soda. It was, however, very soon evident that this did not agree with her skin, and it was left off. Her appetite having improved under the use of the nitric acid, the liquor potassæ was begun with on the 7th of March, and by the 28th there was also a very marked improvement in the acne; the liquor arsenicalis was, therefore, ordered, but I was obliged almost immediately to relinquish it, even in the smallest doses. She was now attacked with severe rheumatism, for which colchicum was given with iodide of potassium; the treatment of the acne being for a time suspended, a relapse took place. I attempted to keep it in check by the use of sulphuret of potassium lotion and other local means recommended by different authors, but they never agreed with her skin, making it decidedly more red and tender. The rheumatism being sub-

dued, Donovan's solution was tried, but her stomach would not bear it. Tincture of steel was then ordered, but it almost immediately brought on dyspepsia, and, as a last resource, she was directed to take the steel mixture of the Pharmacopœia and an occasional aperient pill, using no application to the face beyond very hot water and glycerine and calomel ointment at night. This agreed thoroughly well with her, and she took nothing else during the remainder of her attendance, which, with a few exceptions, lasted up to the middle of October, 1864, when she left, cured, so far as such cases are cured at her age and after lasting so long.

I have greatly condensed this account, as I took very copious notes of it originally, and therefore the inferences I draw may not appear so clear to others as to myself; but it appeared to me that all the benefit obtained was really due to the nitric acid, the liquor potassæ, the steel mixture, and the calomel ointment.

Case 4.—*Simple Inflamed Acne.*—Being anxious not to occupy too much space, the following case is given only in a very condensed form; nor would I have brought it forward but that it was such a severe form of the disease, and filled up the gap between rosacea and punctiform acne:—

The patient, E. S., admitted March 18, 1864, as out-patient at St. John's Hospital, was a young man whose face was almost entirely covered with inflamed acne; the health was thoroughly out of order, the tongue being extremely foul, and the patient himself very weak; the muscular system greatly relaxed. He entirely recovered in about three months, under the use of the acid and deutoiodoret of mercury, followed only by three-minim doses of liquor arsenicalis three times a day.

Case 5.—*Acne Punctata and Comedones.*—Sarah S., a young unmarried woman, applied Dec. 9, 1864, with this disease. The face was almost entirely covered with spots of one kind or other, and on the cheeks the black dots were very numerous. She reported herself in perfect health, except that her appetite was not very good; her tongue was clean, bowels regular, menstruation good. She was not aware of any cause for the eruption, but had always washed with cold water, and fancied that of late it was worse, and that the skin smarted more after washing. The saline was ordered, and immediately followed up by the use of the dilute nitric acid in infusion of quassia; she was directed to wash only with hot water, and to apply the ointment of hypochloride of sulphur on going to bed. As she fancied that beer always made her heavy and sleepy, she was directed not to take any, but otherwise to live well.

By the 7th of January she reported her appetite as ravenous, and some improvement had taken place in the acne. She was now ordered the solution of arsenic, five minims three times a

day, and to leave off the acid, but continue the ointment. The history of the case from this time is that of a moderate, rapid, and uniform decline of the affection. On the 11th of February she was seen, and then presented a remarkable improvement; she was very much pleased with the progress she had made. The black dots had very much diminished in number and there were not above one or two acne spots left, but the skin was almost covered with brown stains, apparently from the action of the hypochloride of sulphur, and was still somewhat rough to the touch. The medicine had made her at times feel low and languid, but she always managed to take it three times a day, and never took anything else all the time she was under my care. When last seen (March 18) she considered herself cured; there had been no fresh spots, the old ones were fading away, and the dots were lessening in number. I wished her to remain under treatment, but she discontinued her attendance. —*Medical Circular, May* 3, 1865, *p.* 279.

61.—RECENT RESEARCHES ON SCABIES.

There is no better way of tracing the development of scabies and no more conclusive proof of the real nature of the affection, than to place an impregnated female acarus upon the skin, and then to leave it to its own devices. The fact of impregnation, which is of course all-important, is readily determined in the way pointed out by Gudden. We have only to extract an acarus, without injuring it, from a recent cuniculus, and then to cut off this portion of the skin containing the cuniculus, and to examine it under the microscope. If it should present ova, we may be quite sure that the animal will afterwards deposit others. Hebra says, however, that a female acarus, even though it may lay eggs, does not always with certainty generate scabies; and he recommends for the artificial production of the disease, the application to the skin of a whole cuniculus removed from another person suffering from that affection.

For the experimental investigation of the habits of the acarus, however, it is best to take a single female, and place it upon the skin. It moves briskly over the surface and soon begins to attack the epidermis. It may either proceed at once to bury itself, or it may leave off after a time, and commence again at another spot. In penetrating the superficial part of the epidermis, the acarus seems to experience some difficulty. It places itself in a position almost vertical with respect to the skin, supporting itself by means of the long bristles which project from the hinder part of its body. Having once pierced the surface of the cuticle, it makes more rapid progress, and in from ten to thirty minutes it is completely buried. It naturally

attacks in preference those parts of the skin which have the thinnest epidermis, and for this reason it appears often to select the entrances of the hair-sacs.

Having thus ensconced itself within the epidermis, it continues to traverse the rete mucosum in a horizontal direction, and proceeds to lay its eggs. The number of ova which are deposited by one acarus is variously estimated. Hebra has never seen more than twenty-four to twenty-six ova in one cuniculus. Gudden, on the other hand, counted fifty-one in one passage, at the bottom of which was the parent, which still contained ova; and he assumes fifty to be the ordinary number. The rapidity with which they are laid varies with the age of the acarus. An experiment of Gudden's, made in the winter of 1859-1860, gives very precise information upon this point. He placed an acarus, which was ascertained to have laid previously only three ova, and which contained another nearly ready to be deposited, upon the skin of a healthy person, who was kept all day in a moderately warm room. At the end of five days, the cuniculus was cut out, and was found to contain eleven eggs. In other observations in which the acari were more nearly exhausted, the eggs were deposited much more slowly, one in two or three days. According to Bourguignon and Gudden, apertures are always found, at more or less regular distances, in the roof of the passages formed by the acari, and it is supposed that they may serve for air-holes. Their existence is positively denied by Hebra; but however this may be, it appears certain that they are not used by the female acarus as means of egress from the cuniculus. The animal, in fact, never emerges from the passage which it has formed for the reception of its ova. It continues to eat its way through the skin, and when its power of laying eggs is exhausted it dies. The whole duration of the life of an acarus is estimated by Gudden at three or four months. Impregnated females, placed on a healthy person's skin, were found by him alive, but exhausted, in the seventh or eighth week afterwards.

Eichstedt stated that the ova are not deposited in the egg-passage in a continuous series, but that there are always intervals after two or three, or at most six, ova. Gudden admits that this is the case in the cuniculi which are seated on the hands, where the acarus is exposed to frequent disturbance; but he says that on the trunk as many as twenty-one eggs are often found in an unbroken row.

Embryos are rapidly formed in these ova. In examining under the microscope any cuniculus in which several eggs have been deposited, these are usually found to present different stages of development. There are, however, rarely more than from eight to fourteen which contain embryos; the others are

merely egg-shells, from which the young acari have already escaped. Assuming that the parent animal lays one or two eggs daily, this gives some idea as to the rate at which they are hatched. There is, however, more direct evidence on this point, though it is not very satisfactory. If the ova are placed in watch-glasses and kept at a proper temperature, which is effected by fixing them in the axilla, they may be hatched artificially. Gudden says that four days was the shortest time within which the young acari have left the shell in his experiments. The statements of earlier observers are rendered valueless by the doubt whether the ova had been recently deposited when the process of incubation was commenced. It is, however, tolerably certain that the time is not always the same ; for Gudden says that, after placing upon the skin acari which no doubt at once proceeded to deposit eggs, no empty shell was found within the cuniculus, in one case on the fifth, in another on the sixth day. It would be of great importance to ascertain how long the ova retain their vitality, when they are placed under unfavourable circumstances ; but as to this point there is at present no evidence.

Having left the shell, the young acari almost immediately make their exit from the cuniculus also ; and, according to Gudden, they avail themselves of the air-holes which he describes as existing in its roof. They then move over the surface of the skin with considerable rapidity, and, after a time imbed themselves again within the cuticle. The passages which they form are usually very short ; Gudden says that he has seen some a line in length, but that these are rare exceptions. He states, however, that the young penetrate into the skin more deeply than the older acari, and that they therefore produce more irritation. Their bite is often followed by the appearance of a small papule or vesicle, in which exudation shows itself on the second day. Before this time the animal has usually moved off to another part of the skin. Hence the young acari are very difficult to find, but, according to Gudden, a diagnosis may sometimes be made, in slight cases of scabies, in which none of the larger cuniculi are to be detected, by cutting off the heads of some of the vesicles or papules, and examining them, without any varnish to render them transparent. The entrance of the passage formed by the young acarus may then be made out. When the light comes from below, the dried edge of the opening looks dark.

It is well known that the acarus is exceedingly sensitive to changes of temperature. Itch-insects, when first extracted from the cuniculus, often remain motionless ; but if the glass slide on which they are laid is warmed, or if the warm breath is allowed to pass over them, they at once begin to move. Gudden states hat, when they are placed upon the skin, the rapidity of their

movements is always observed to depend upon the temperature of the surface at the time. Admitting the influence of warmth on the activity of the acari, it seems natural to ascribe to the movements of these animals the irritation which those who have scabies experience when the body first becomes warm in bed. Everybody knows that the itching is then worse than at other times; and Gudden says that a similar increase of irritation is felt whenever the skin is warmed, whether by the sun's heat, by exposure to a fire, or even by exercise; and, according to the same observer, cooling the surface quickly relieves the itching.

Some of the other peculiarities of scabies appear to recieve their explanation on the same principle. If the acarus moves only on those parts of the skin which are warm, and therefore chiefly at night, it would seem to follow that parts which are uncovered during sleep will remain free from their presence. In this way Gudden accounts for the well-known fact that the face rarely presents any traces of the eruption in cases of scabies, and he states that this immunity is enjoyed by the face only when it is exposed at night; and, as we have already seen, several observers have found acari on the face or forehead of infants, who lie with those parts deeply imbedded in pillows. An experiment made by Gudden points to the same conclusion. He placed a female acarus upon the left hand of a man who always slept on the left side, and with the clothes carefully pulled up round his chin. The young brood were traced up the arm on to the trunk, and one was caught on the left cheek, which lay in the warm. The other side of the face remained free from their presence. The same writer says that cuniculi are rarely found on the feet of people whose feet are constantly cold. He also relates a very interesting case in which acari occurred in great numbers on the trunk, while none could be detected on the hands. This patient was confined in a strait-jacket, and her hands and feet were always cold, and did not become thoroughly warm even when she was in bed, as she was so unquiet that the bed-clothes could not be kept over her. The inner side of the arm, which was fixed to the side, presented a few cuniculi. This case is the more conclusive, as Gudden states that it was left undisturbed for a considerable time.

We are inclined to explain in a similar way a fact which seems to have been observed first by Hebra, and to which we have more than once heard him draw the attention of his class—that the disease is always present in large quantity on parts of the skin which are exposed to pressure. Thus in cobblers, tailors, weavers, and other artisans who sit on hard benches or stools, the buttocks, and especially those parts of them which come into contact with the seat, are always covered with the eruption.

This consists in part of papules, in part of pustules and crusts; and some of these elevations of the skin present cuniculi on their long axis; others contain no parasite. On the other hand, in joiners, carpenters, and bricklayers, this part of the body is unaffected by the disease. Again, in women the eruption always shows itself on those parts of the skin which are pressed on by straps or girdles; and the pressure of garters, trusses, or of any tight article of apparel, or even of a crutch, is said by Hebra to be sufficient to produce the same effect. He accounts for these facts by ascribing the papules and pustules to direct irritation of the cutaneous surface; but it seems to us more reasonable to suppose that the pressure keeps up the warmth of the skin at that part. and that this favours the development of the acari, and at the same time prevents their wandering to other parts of the epidermis.

Hebra, however, does not admit that the distribution of the itch-insect over the skin is influenced to any great extent by temperature; but his reasons for this opinion do not appear to us to have any great weight. He says that if it were so, the eruption of scabies ought to increase rather than diminish during the progress of acute diseases when the patient is kept constantly in bed; but there is every reason to believe that the morbid condition of the system has in this case a direct influence in checking the development of the parasite. Another of his arguments is, that if the acarus loved warmth, it ought to select the axilla, the bend of the elbow, and the softer parts of the skin, rather than the hands and feet, the penis, the buttock, and the extensor surfaces of the joints, on which parts cuniculi are found most abundantly. But we have already seen that at the moment when the acari are moving over the surface of the skin, these parts are for the most part warm, and that the distribution of the acari is rather favourable to the view to which Hebra is opposed. Again, he gives as a reason for thinking that the acari are not much affected by external warmth, the fact that they reside in the deeper layers of the cuticle, which must be kept of a nearly constant temperature by the blood circulating through the derma; but this appears to us to remove a difficulty in the way of Gudden's view, by accounting for the fact that the ova can be developed in the cuniculi which are seated on the hand, and which must otherwise be exposed to considerable variations of temperature.

The truth is that, in Hebra's opinion, the acarus forms a very unimportant element in the causation of scabies, except so far as contagion is concerned. He criticises the views of Gerlach and Aubé and others, who looked on the acarus as a kind of nocturnal beast of prey, which hunts for spoil at night on the surface of the skin, and retires during the day into the dark

gallery which serves as its retreat. He says that it is not likely that the acari leave their stations of their own accord and without necessity, and take long journies, in order to seek at another spot and with considerable trouble what they can get abundantly by staying where they are. Even in the propagation of the disease, Hebra regards them as altogether passive. He thinks that the cuniculi are torn open by the patient's finger-nails, and that in this way the ova and young acari are carried not only to the skin of other persons, but even to different parts of the same patient's body. Now, it is universally admitted that the female acarus never emerges from the cuniculus in which she lays her eggs; but it appears to us to be quite established, by the experiments of Gudden and others, that the young acari have the power of distributing themselves widely over the skin by their own movements; in fact, according to Gudden, they probably seldom remain more than three days in the same place.

Hebra makes the remark (and other dermatologists have said the same thing) that, viewed as a disease of the skin, scabies can scarcely claim an independent place in the scheme of classification, but that it should be regarded rather as an artificial eczema, caused by the presence of the acari and by the *scratching of the patient.* Now it is obvious that, if the acarus be the sluggish animal which Hebra supposes it to be, its presence in the skin is not likely to give rise to very much inflammation; and accordingly we find that of the two factors to which he ascribes the development of the eruption, the scratching on the part of the patient is the one to which he attaches most importance. It has long been known that the severity of the eruption is by no means proportionate to the number of acari which can be discovered, and that in the pustular scabies of children scarcely any cuniculi are sometimes to be found. Hebra also states that in no case does the seat of the acari and that of the eruption correspond; for while the former are found chiefly on the hands and feet, the penis, &c., the eruption is always most abundant on the anterior surface of the body, between the mammæ above, and the knees below. This he accounts for by supposing that the acari only produce a vague itching, not referred to any particular point, and that therefore the patient scratches himself at that part of the body which is most accessible to himself; that is to say, on the chest, abdomen, and thighs. To us this explanation does not appear very satisfactory. With the exception of those papules or pustules on which cuniculi are seated, Hebra does not admit any part of the eruption of scabies to be caused directly by the irritation of the acari, but regards it all as the effect of scratching, with the exception of those appearances which, as we have seen, he ascribes to pressure.

There is, however, good evidence to show that papules and pustules may be produced in scabies, independently of scratching. Gudden says that his patient, who was confined in a strait-jacket, presented tolerably large pustules not only on other parts, but also on the shoulders, which were but little exposed to external irritation. Again, he placed a female acarus on the skin of a healthy man: she formed a cuniculus and deposited ova. Even during the first few days a kind of itching was felt over the whole body, which he rightly ascribes to excited attention; but on the ninth and tenth days a new sensation was felt, which was referred to the hand, and resembled a pricking or gnawing; and before long papules and vesicles made their appearance, and gradually increased in numbers. *Scratching was altogether refrained from*, and the eruption was caused solely by the bites of young acari. The point is not, perhaps, of much importance, for every one must admit that scratching does to a great extent aggravate the eruption in most cases of scabies; but it is, as we think, quite clear that the great German authority on cutaneous diseases is not altogether justified by the facts in his views upon this subject.

There can be no question that, since the appearance of the cuniculi has been thoroughly understood, the diagnosis of scabies has been immensely facilitated; it has, in fact, in a large number of cases, becomes a matter of demonstration. But we doubt whether these passages are generally recognised by medical men in this country. Only three or four years since an eminent physician recommended searching for ova, rather than for the parent acarus, in doubtful cases. We have several times tried to find them, as he advised, by scraping the skin or examining the crusts; and, as might be expected, we have always been unsuccessful. But when one has once learned thoroughly the appearance of the cuniculi, the finding of the ova is often an affair of a few seconds only. We would strongly recommend to those who are learning medicine, the practice of slicing off with a sharp knife or pair of scissors any doubtful cuniculi, and examining them, *en masse*, under a low power of the microscope. In order to remove the parent acarus, it is necessary to cut rather deeply; but the detection of the ova or of the fæces may usually be effected without causing the slightest pain. The recognition of these cuniculi is of the more importance, because it appears that in some cases they are the only manifestations of scabies. Baum and Eichstedt have especially drawn attention to this form of the disease, in which there is no trace of papules or of pustules; and Lanquetin describes a similar case, that of a young hysterical girl, who did not suffer from itching, and whose skin was quite healthy. This case might no doubt be cited in favour of Hebra's opinion, that the eruption is caused

by scratching; but it is more probable that some morbid state of the cutaneous sensibility caused the absence of both the itching and the eruption.

We have already quoted the directions of Gudden for discovering the young acari or the short cuniculi in which they dwell. Gudden thinks that in almost every case of scabies, even though none of the longer passages can be found, it will be possible to detect those of the young animals; but it does not appear that he has under observation more than a small number of patients. In his earlier papers Hebra asserted that without the discovery of the cuniculi we are not justified in concluding that scabies is present. But the experience of 40,000 cases had caused him to change his opinion, and he now says that it is possible to make a diagnosis of the disease with great probability, if not certainty, in cases in which no cuniculi, nor even any of the papules caused by young acari, can be recognised. There can be no doubt that such cases do sometimes occur. Moreover, it must not be forgotten that the presence of cuniculi on the hands may be interfered with by many circumstances. In those who wash their hands very frequently, or who use pumice-stone to cleanse them, these passages are quickly destroyed; and, according to Hebra, they are also absent on the hands of washerwomen, hatmakers, and bricklayers, because these people employ in their business substances which are prejudicial to the acarus. In Paris an exaggerated importance is attached to the presence of a cuniculus on the skin of the penis, or on the glans, in the diagnosis of this disease; and according to Piogey, scabies is sometimes limited to that part only. We have heard Hardy insist on the fact, which we think he has also published, that eczema, confined to the female breast, is almost always caused by the presence of acari.

In No. LXVI. of the British and Foreign Medico-Chirurgical Review (April, 1864, p. 392), an account was given of the "rapid cure" introduced by Hardy at St. Louis. This method appears to be attended with very considerable success, and it undoubtedly presents the great advantage that it is carried out under the eye of the physician. Lanquetin states that it is doubtful whether all the cases are cured, as they are not kept under observation within the hospital. Great irritation of the skin is sometimes caused by this treatment, and therefore it is not adapted for private practice. Moreover, as Hebra remarks, the saving of time is more apparent than real, for the disappearance of the eruption must always take some days; and till that has occurred, the lay observer would not believe that a cure had really been affected. Altogether, Hardy's plan of treatment seems best adapted for soldiers and the poorer class of labourers. We have often wondered why one of the large metropolitan

hospitals does not establish a "skin department" on a large scale, in which these affections could be treated locally with baths, &c., on the premises, as is done in St. Louis and at Vienna.

In cases in which the eruption is generally diffused and severe, while cuniculi can be found only on certain parts of the skin, it might perhaps be advantageous to recommend inunction only at those points. Hebra states that he did this at one time with very fair success, but he then believed that the acari were rarely to be found except on the hands and feet; and when he gave up this opinion, he seems to have modified also his practice, so that his statement upon this point ought perhaps to be received with some caution, and as indicative of the sanguine nature of the man.

It seems to be generally thought in this country, that in order to prevent relapses it is necessary to disinfect the patient's clothing, in addition to inunction of the skin. Dr. Frazer of Dublin, states that he has seen pustular scabies return more than once in a young child, till a pair of boots were destroyed to which the virus (according to his view) was persistently adhering. But though it cannot be denied that portions of loose epidermis, or crusts containing ova, may remain in the clothes, and so that a second contagion may arise, it does not appear that this is frequently the case. Gudden says that persons often sleep in their dirty beds, after treatment, without any relapse occurring. In the General Hospital at Vienna, where 1500 patients come under treatment every year, no attempt is made to disinfect the clothes, although there is every appliance requisite for doing so. The relapses are said never to exceed one per cent. It appears to be certain that living acari never wander of their own accord into articles of clothing, as pediculi often do.—*British and Foreign Medico-Chirurgical Review, July*, 1865, *p.* 24.

62.—LARGE AND PAINFUL CARBUNCLE, TREATED SUCCESSFULLY BY SUBCUTANEOUS SECTION.

By Christopher Heath, Esq., at the Westminster Hospital.

In June, 1862, Mr. French, surgeon to the St. James's Infirmary, brought before the Medical and Chirurgical Society a plan of treating carbuncle which he had pursued with great success for many years. It consists in the subcutaneous section of the indurated tissue by a tenotomy knife, which is introduced a little beyond the edge of the induration; and, the forefinger of the left hand serving as a guide upon the surface, the tumour is divided just as a tendon would be cut through.

The skin itself is left uninjured. If the carbuncle is large, this process is repeated in different positions, so that the mass is crucially divided subcutaneously. We have seen a large number of cases treated by this method. The immediate relief obtained, and the rapid recovery which follows, are very striking. Every surgeon who has practised the old operation of crucial incision knows that it is necessary to cut deeply enough to divide the hardened base of the carbuncle. Mere division of the skin is useless; more than this, it is mischievous, for a widely gaping wound is formed, which is often most troublesome to heal, and leaves eventually a very ugly cicatrix. This is entirely avoided by Mr. French's process.

The following is a case of carbuncle in which Mr. Heath pursued this plan with the highly satisfactory result recorded:—

Henry W., aged 46 years, was admitted July 3rd, 1865, with a large carbuncle on the back, measuring six inches in diameter each way. This had been coming for ten days, and two days before admission the skin in the centre had given way, exposing a slough, but the surrounding tissue was greatly swollen and inflamed, and he was suffering great agony.

July 4th. The patient having been placed under chloroform, Mr. Heath made a crucial subcutaneous section of the carbuncle with a narrow bistoury. The knife was entered at the magin of the inflamed skin, carried well beneath the carbuncle, and the point brought up to the central opening, when the whole thickness of the subcutaneous tissues were divided crucially, the knife being entered four times on account of the large diameter of the carbuncle. The hemorrhage was very free, and was checked by a pad and broad bandage. Low diet; beef-tea, two points; wine, ten ounces. Aromatic spirit of ammonia, half a drachm; liquor of cinchona, fifteen minims; water, one ounce: three times a day.

5th. Passed a good night, the pain being greatly relieved by the incisions. Pad removed. The inflammation has considerably subsided, and a small quantity of pus exudes from each puncture. Poultice.

12th. Patient's recovery has been uninterrupted. The inflammation has entirely subsided; the hole in the centre has not increased, and a slough of cellular tissue is now separating.

14th. Water-dressing to wound, which is quite clean. Full diet. Dilute nitro-hydrochloric acid, twenty minims; liquor of cinchona, fifteen minims; water, one ounce; three times a day.

21st. Convalescent, and on the 25th he was discharged cured. —*Lancet, Oct.* 21, 1865, *p.* 455.

63.—ON A CURE OF ULCERATION OF THE TONGUE WHICH HAD EXISTED FOR TWENTY YEARS.

By Dr. Arthur Leared, Senior Physician to the Great Northern Hospital.

[The patient was 62 years of age, and had a sloughy oval-shaped ulcer on the middle of the dorsum of the tongue, the long diameter of which was that of a shilling. The ulcer had existed for twenty years, during which time its shape and appearance had undergone little alteration. The patient had had primary syphilis thirty years before.]

Partly influenced by the apparent non-syphilitic view of the case, I prescribed chlorate of potash in full doses, with a strong solution of the same for local application. This treatment was persisted in for more than a month without benefit. I now resolved to try the effect of more active agents. Four minims of Fowler's solution of arsenic were ordered to be taken three times a day, and a mercurial bath twice a week; the ulcer of the tongue to be touched daily with nitrate of copper. This treatment was continued for twenty-five days, the dose of arsenical solution having been increased to five minims. It was noted that after the first week the tongue had slightly improved, but further improvement, if any, was very trifling. The baths seemed to have caused a troublesome eruption between the shoulders. Donovan's solution of arsenic, iodine, and mercury was now given in doses of twenty minims twice a day.

On the fourth day of this treatment I had the satisfaction to find that the ulcer on the tongue had broken up into two patches, leaving a sound intervening portion between them. As the medicine purged, a pill containing half a grain of opium was directed to be taken after each dose.

On the tenth day the largest of the ulcers on the tongue was about the size of a split pea. The patient's feet had now become so sore that he could walk only with difficulty; there was a decided inflammatory blush round the heels and balls of the great toes, which were also very tender.

On the twenty-sixth day the tongue had healed, except in a mere point; but the feet were very sore, red, and desquamating; the palms of the hands were also becoming affected. He complained also of an aching in the back of the gums. The dose of the medicine was therefore reduced to one-half. Two days later the tongue and mouth were quite sound, with the exception of some aching in the gums. The medicine was persevered in for some time longer in diminished doses, during which the affection of the extremities gradually disappeared.

About five months after the healing of the ulcer, copper-coloured scaly patches appeared on the lower extremities. These

yielded slowly to iodide of potassium with mercurial baths. He is now quite well, and the tongue and mouth have continued sound.

Remarks.—The persistence of an ulcer on so vascular an organ as the tongue for twenty years is of itself remarkable ; but its cure illustrates in a signal manner the power of medicine. The most inveterate sceptic could hardly maintain that the cure had been spontaneous, and that the medicines coincidentally taken had been simply inert. Such a case is an answer to those who deny the efficacy of drugs—a thing, let me add, only denied by those who have never given their minds to the study of therapeutics. The employment of arsenic and mercury together was suggested by a natural anxiety to benefit the patient as speedily as possible; but, in reference to the determination of the separate action of the remedies, would have been better avoided. The skin eruption proved the syphilitic nature of the case, and it is an interesting circumstance that the ulcer seems to have acted as a derivative, since there was no eruption while it existed. Mercury was probably the most effective agent ; but there is no reason for supposing that in certain cases of syphilis arsenic is not also highly useful. Experience convinces me of the greater utility of these powerful drugs in some chronic cases than either of them separately. Inflammation of the feet and hands is a singular effect of arsenic, only glanced at in works on therapeutics. Another well-marked instance of it occurred to me some time since in the case of a gentleman, for whom I successfully prescribed Fowler's solution in increasing doses for a refractory form of eczema. His feet were as red and swollen, and walking as much interfered with, as if he suffered from a severe attack of gout. —*Lancet, July* 8, 1865, *p.* 34.

64.—SOLUTION OF VENICE TURPENTINE AS A DRESSING FOR WOUNDS.

Alluding to M. Nélaton's approval of camphorated spirit as a dressing for wounds in his wards, M. Kerner states that this has the disadvantage of being expensive and easily evaporable. He states that, being surgeon to the Messrs. Dulfuss' factories at Mulhouse, where from 3000 to 4000 workpeople are employed, he has ample experience in treating all kinds of wounds, and finds the following a most valuable as well as a cheap application :—Venice turpentine, 2 lb. 8 oz. troy ; bicarbonate of soda, 6½ drachms; water, 18 pints Imperial. This is to digest in a bath for six days, at a temperature not higher than 75° C., and then filter. It constitutes a highly soluble turpentine soap, which is very cheap, and evaporates slowly. The cicatrisation

of even very large wounds under its use is wonderfully rapid, the secretion of pus being very slight, while there is an entire absence of fœtidity. A compress, consisting of eight folds of linen well soaked in the solution, is applied over the whole breadth of surface, and left on (covered with oiled silk) for twelve hours, being moistened by means of a sponge with some of the solution every four or five hours. Granulations speedily shoot forth, requiring to be touched with nitrate of silver; but the discharge is quite insignificant, so that none of the encumbering apparatus required when cerates are used need be resorted to. When the wound is accompanied with crushing or contusion, leading to the fear of much inflammation, it should be exposed to a jet of cold water for some days before employing the turpentine.—*Medical Press, Sept.* 20, 1865, *p.* 274.

65.—ON ILL-SMELLING FEET.

By Professor Hebra.

[There is no effectual remedy known for this disagreeable affection. Professor Hebra has endeavoured to investigate the nature of this anomaly in secretion, and to discover the means of relieving it.]

The first question he put to himself was, whether the smell was inherent to or derived from some condition external to the economy, and he soon came to the conclusion in favour of the latter view. In repeated instances the shoes and stockings of persons suffering from stinking feet were taken away from them, and the feet carefully cleaned with soap and water by means of a nail brush. They were then put to bed, warmly covered up, and freely supplied with warm and diaphoretic drinks until a free transpiration was secured. The feet were carefully enveloped in gutta-percha paper, or other waterproof material, so as to prevent the passage of the sweat. The sweat of the entire body, though having its acid odour, did not manifest anything of the stinking character; but when the waterproof coverings of the feet were left unchanged the penetrating stink was gradually produced until it predominated. The shoes, which had been kept away from these persons, retained for weeks the filthy odour. The expression "stinking foot-sweat" is, in fact, an incorrect one, the proper one being "stinking shoes produced by an excessive production of sweat." The influence of stout, thick shoes as a proximate cause of the odour is seen in the facts that copious sweating of the hands is not attended by ill-smell, evaporation not being impeded, and that persons going barefoot and women who wear thin shoes are seldom liable to it.

The indications for treatment are leaving off the shoes which have induced the stink, and the application of means which have been found by experience capable of diminishing the excessive secretion. In slight cases it suffices to dust the insides of the stockings with some simple powder—such as lycopodium, alum, or even common flour. If this simple means fail, the following may be employed with certainty of success :—Some diachylon is to be gently melted over a fire, and then an equal weight of linseed oil is to be added, so as to form a homogeneous ointment. This is to be spread on linen, in which the foot, having been thoroughly washed and dried, is to be completely and exactly enveloped. Where the toes come into contact, shreds of lint covered with the ointment are to be interposed. So wrapped up, the foot is to be covered with a stocking and a light shoe, well open at the instep. At the end of twelve hours the application is to be removed, and the foot is to be well rubbed by means of a dry towel or one of the powders mentioned before, but neither washed nor bathed. It is then to be covered up with the ointment again. This procedure will be required to be repeated, according to the intensity of the evil, during eight or ten days, but the patient meanwhile is enabled to go about his ordinary occupations. After this time the ointment is to be left off, but friction by means of pulverulent substances is to be continued a while longer, and the ordinary shoes worn. After some days, brownish-yellow portions of epidermis, about half a line in thickness, separate from the affected parts, leaving a white, clean, healthy epidermis behind. It is only after this separation has taken place that washing the feet or the use of a foot-bath is to be allowed ; and for some time afterwards the pulverulent substances should still be rubbed into the foot. In this way, at the end of from fourteen to twenty-one days, the foot-sweating either disappears for ever, or, at least, for one or more years. In quite exceptional cases, to secure this end, a repetition of the above procedure for a second time is required ; but then it is invariably successful. Professor Hebra has, during fifteen years, employed in several hundred cases this with success, and without the least attendant disadvantage.—*Allgem. Wiener Med. Zeitung.*

[M. Stanislas Martin *(Bull. de Therap.*, t. lxv., p. 143) observes that some of the applications employed for removing this disgusting infirmity are not always harmless, the arrest of transpiration having in some cases been followed by neuralgia, disturbance of the digestive organs, &c. The diffusion of the abominable stink may be effectually prevented by placing a sole containing a layer of the powdered charcoal either between the foot and the stocking, or between the latter and the shoe. A paste, composed of forty parts of powdered charcoal, forty of

water, and fifteen of gum, should be thickly spread over a piece of filtering-paper, flannel felt, &c., stretched over a board or pasteboard. The paste is then covered over with another piece of paper, which is to be smoothed with the hand so as to remove all asperities. The whole is submitted to compression during an hour, after when the water is to be allowed to evaporate. When quite dry, the sole may be cut out of the required size. Being so cheaply made, these soles can be changed once or twice a-day, if required.]—*Medical Times and Gazette, Sept.* 2, 1865, *p.* 265.

DISEASES OF THE EYE AND EAR.

66.—ON CATARRHAL OPHTHALMIA.

By Henry Hancock, Esq., Senior Surgeon to the Charing Cross and Royal Westminster Ophthalmic Hospitals.

[Catarrhal ophthalmia is predisposed to by whatever tends to depress the nervous system and to vitiate the blood. It is a perfect pest to the children confined in our large pauper establishments. The disease should be treated more by general than by local means.]

From many years' experience in the treatment of catarrhal ophthalmia by local astringents, such as nitrate of silver, sulphate of zinc, &c., I am convinced more frequently than otherwise, that their employment prolongs the complaint, and causes granulation of the lids. Freely admitting that bleeding, local or general, frequent doses of calomel, or any violent depleting remedies, do harm and should be avoided, as in erysipelas, I have for some years past entirely restricted my treatment of catarrhal ophthalmia to constitutional remedies, for the most part of an attractive, a stimulating, and tonic character, merely directing the eyes to be fomented frequently with warm water, as much for the purpose of cleanliness as of comfort. I now very seldom see granular lids follow catarrhal inflammation; whilst the cure has certainly not been more protracted than when local applications were most successfully employed. The cases in which this treatment is most beneficial are those described by Mackenzie as "pure mucous or blenorrhœal inflammation of the conjunctiva;" in other words, in simple catarrhal inflammation—ophthalmia *unaccompanied by supra- or circum-orbital pain*, and for the most part confined, at all events in its early stages, to the conjunctiva and the Meibomian follicles. In these, the disease mostly comes on suddenly, commencing with a sensation of itching and stiffness, speedily converted into a feeling as though grit or sand were in the eye.

Upon examination, the eyelashes are found loaded with thickened glutinous mucus. The eyelashes are swollen, their lining conjunctiva being of a darkish red colour and flabby; whilst that of the eyeball, in the milder forms of the disease, is traversed by a network of vessels of the same dark red colour, which can readily be moved by pressing the lower lid against the eyeball, which in most instances is marked, especially at its lower half, by patches of extravasated blood, distinguishing this disease from the more acute and phlegmonous inflammation of the conjunctiva.

In its most simple form, the disease will be restricted to the angles of the lids and adjacent conjunctiva. When more severe, it will extend over the whole surface of the lids and eyeball; whilst, in still more severe and serious cases, the subconjunctival cellular tissue is infiltrated and raised, forming a distinct elevated fleshy ridge around the cornea, which appears sunken in, and at times partly obscured by irregular masses of swelling, investing its surface, and constituting that condition termed chemosis. At the same time, the conjunctiva of the eyelids becoming in like manner infiltrated, the latter are puffed and swollen, creating difficulty of opening the lids, and in this way impeding vision.

Even when the amount of chemosis is considerable, the cornea for a time remains clear; but, if this condition exist for two or three days, it will become hazy, opaque, yellowish, and ultimately slough and give way, allowing the iris to protrude, resulting in more or less destruction of vision.

Lacrymation is always increased, the secretion being sometimes quite clear, at other times thick, yellowish, or mucopurulent. The symptoms towards night increase in severity; the intolerance of light is greater; the patient is feverish, and complains of pain and weight in the head, principally in the region of the frontal sinuses, and in the course of the lacrymal sac and ducts. These symptoms usually subside after the patient is quiet in bed; but they are sometimes so severe as entirely to prevent rest or sleep. In such cases, the Dover's powder or opium is of the greatest service, and will frequently cut short the attack. In ordinary cases, I give bark and ammonia; but, when the patient resides in a low damp locality, it may be necessary to give the sulphate of quinine in full doses, with or without opium, according to the intensity of the pain and the irritability of the patient; whilst the local applications should be restricted to warm water, or at most a poppy-head fomentation, to the exclusion of all local remedies of a stimulating or astringent character.

So long as the tongue is coated, and the breath foul and

offensive, mild alterative aperients, such as pilula hydrargyri, with hyoscyamus and extract of colocynth, are of great service, especially where there are chemosis of the conjunctiva, and tendency to opacity or sloughing of the cornea. In such cases, bleeding whether local or general, violent purging, and local applications of a stimulating and astringent character, do considerable mischief, whilst, on the other hand, I have commonly seen the happiest results from mild alterative aperients—bark and ammonia or quinine, with or without opium, according to the amount of pain; with warm and soothing local applications. —*British Medical Journal, June* 24, 1865, *p.* 633.

67.—ON THE YELLOW AMORPHOUS OXIDE OF MERCURY AND ITS APPLICATION IN CONJUNCTIVITIS AND CORNEITIS PHLYCTENULOSA.

By Dr. Pagenstecher, Wiesbaden.

Red precipitate, the red oxide of mercury, has hitherto played an important part in the treatment of the superficial diseases of the eye, and in many instances constitutes the basis of several secret popular remedies. It is especially used in various kinds of blepharitis, in the form of an ointment, and valued by every oculist as a very favourite remedy. In diseases of the conjunctiva, and cornea too, when the object of the surgeon was to produce a stimulant or alterative effect, we find in the "Pharmacopœia" several compound ointments of this description recommended. But these ointments mostly possess the disadvantage of being inapplicable to all these forms of disease, and especially so to conjunctivitis and corneitis phlyctenulosa, being often found to irritate too much. Numerous and prolonged trials that I instituted years ago, proved to me that the red precipitate in ordinary use was, from its crystalline form, not sufficiently finely divided, and consequently did not act uniformly on the surface of the diseased membranes; very often too, got retained in the folds of the mucous membrane. and there set up a caustic action, which was rather prejudicial than otherwise to the subsidence of the disease. I became positive of this fact from some experiments I instituted with this substance, which was first reduced by many hours' trituration to as fine a powder as possible, using as a vehicle fat, which melted quickly from the natural warmth of the conjunctiva. Thus the remedy was, by the movements of the lids, equally distributed over the diseased surfaces; and at the same time, the probability, or rather the possibility, was avoided of any irritation being produced by its remaining too

long in the conjunctival sac. Even these experiments yielded by far more favourable results. But the ointment was rendered still more perfect when I, acting under the advice of apothecary Dr. Hoffmann, substituted the yellow amorphous oxide of mercury. This preparation, which up to that time (1856) had found no place in the pharmacopœia, but was well known to chemists, possesses the great advantage of being in a state of the finest possible division, prepared, as it is, by precipitation; and, being altogether destitute of any crystalline form, it does not, like the red precipitate, adhere to the conjunctival tissue by any fine points and angles. But this preparation differs materially not only in form, from those which have hitherto been employed, but also in its chemical properties, which explain and render intelligible the results obtained in practice. I may be permitted to give the preparation of the ointment in Dr. Hoffman's own words :—

"Two forms of oxide of mercury are recognized :—

1st. The crystalline, or red oxide, prepared by the dry method, and commonly known as red precipitate, constituting the very common remedy; and

2nd. The amorphous, or yellow oxide, prepared by the wet method by precipitation; up to within a few years unknown to the pharmacopœia, although it is indubitably preferable to the first.

The common red precipitate is rendered applicable to practice by being triturated in a porcelain mortar till no more brilliant crystalline points can be perceived: a powder is thus obtained, which is quite soft, and when rubbed between the fingers no longer imparts any gritty feel. If this, after being prepared in the most careful possible way, is submitted to the microscope, it may, under a magnifying power of even 120 diameters, be recognized as a mass of broken crystals. The point up to which the trituration should be continued, which forms the measure of the fineness of the division, is in this method uncertain and inconstant. Thus this preparation occurs in different degrees of fineness in different shops; and as its efficacy is intimately connected with its fineness, the surgeon gets preparations which act with unequal strength.

For obtaining, therefore, a preparation uniform in its effects, and in the finest possible state of division, the yellow precipitate, which is thrown down, is highly to be recommended. Thinking this would also prove a far more energetic preparation, I, in 1856 for the first time, prepared some, and recommended its use to Dr. Pagenstecher in his eye-practice, instead of the common precipitate, and found my anticipation most gratifyingly

confirmed. The mode of preparing the yellow precipitate, although well known, may be still worth mentioning. Care must be taken in the precipitation to obtain a pure oxide, and not any of its compounds, to which precipitates of mercury have a great tendency—a fact which might detract from the efficacy of the preparation. The precipitation is effected by adding a solution of the chloride of mercury to a solution of potash, in such a way that there is always an excess of the latter. After the precipitate has deposited itself, the supernatant fluid is at once poured off, the precipitate thoroughly washed with distilled water, and dried by a gentle heat, with exclusion of daylight. Thus prepared, the yellow precipitate has a light-yellow (that of the yolk of egg) colour, and is an exceedingly fine powder, which, even under the microscope, appears completely amorphous. In addition to both the above-signalized properties, it differs from the ordinary precipitate in its chemical behaviour, being much more quickly acted on by reagents. A solution of oxalic acid, which acts on the red oxide only after boiling, very quickly changes the yellow oxide, even at the ordinary temperature, into the white oxalate. The preparation of hypochloric acid gas depends on the property the yellow oxide of mercury possesses of decomposing in contact with chlorine gas; the results being hypochloric acid and chloride of mercury; whereas the red oxide undergoes, with chlorine gas at the ordinary temperature, hardly any change. This difference of chemical behaviour of the two oxides constitutes a different degree of resistance to the various agents they are submitted to, and is explained by their different states of cohesion. In respect to the use of the yellow precipitate for eye-ointments, I may be allowed to say a few words on the vehicle of the ointment. The most perfect vehicle for an eye-ointment must be very soft, without, however, being too fluid, lest the heavy oxide sink to the bottom; but when in contact with a moderate heat of the body, it must completely melt, so that the preparation it contains may become quickly and uniformly diffused over the eye. Besides this peculiarity of consistence, the vehicle must be, as far as possible, indifferent in its behaviour to the oxide, and exhibit the least possible tendency to rancidity, which might exert a deoxidizing, reducing action on the oxide. Numerous experiments with hog's-lard, butter, glycerine, glycerine ointment, and mixed fats, have led me to give the preference to the last; and I recommend either the mixture of spermaceti, wax, almond-oil, and rose-water, known as 'cold cream,' only omiting the water, as this favours rancidity, and substituting for it quantities of almond oil, varying according to the heat of the weather; or a mixture of butter, of cocoa, and almond-oil, likewise proportionate to the temperature. In both compounds the

almond-oil must be as fresh as possible, and had best be prepared by the apothecary himself.*"

The ointment is indicated in conjunctivitis and corneitis phlyctenulosa, and all the allied and resulting forms of corneal diseases. To avoid any misunderstanding, I will enter a little further into the symptoms and nature of this disease. At the risk of repeating what has been long known and universally accepted, I must give a short sketch, in order to indicate in what forms and under what conditions I principally recommend the use of the ointment. I consider conjunctivitis and corneitis phlyctenulosa, which have been called by different authors by the most different names, according to the views they took of their causes, as a purely local disease of the conjunctiva and cornea, as one and the same condition, which becomes modified secondarily by the constitution of the patient. The anatomical, typically characteristic, form consists in vesicles, or pustules, on a basis of infiltrated tissue of the ocular conjunctiva; they are developed mostly near the cornea at the limbus conjunctivæ, or, from the very commencement, on the cornea itself. These vesicles soon pass, as the epithelium gets destroyed, into raw surfaces, the surrounding infiltrations becoming removed, a loss of substance in the form of an ulcer thus ensuing. The morbid action varies extremely in its intensity; so does the extent of surface denuded of its epithelium; but a greater or less development of vessels is always observed as a concomitant phenomenon. The mode of arrangement of the vessels around the vesicle is somewhat peculiar: the vessels are all directed centripetally towards the vesicle. If the vesicle is on the ocular conjunctiva, the vessels run uniformly from all sides towards it as a centre; but if the vesicle is at the edge of, or on the cornea itself, the vessels also run to it from the adjacent parts of the conjunctiva; and thus aggregations of highly hyperæmic vessels are seen, which often rise above the level of the conjunctiva, whilst the rest of the conjunctiva exhibits comparatively few signs of irritation. If, on the other hand, the vesicles are developed more or less over the whole ocular conjunctiva, this latter may assume a more general redness. This may also occur if

* As regards the strength of the ointment, I generally use one drachm of oxide to one ounce of fat. This may appear very strong to some, but experience amply shows that, applied in proper cases, it does not in any way irritate too much. Idiosyncrasies may, of course, be observed, as in every remedy; and if the ointment in a given case irritates too much, its strength may be reduced to 30 grs. of oxide to the ounce. I may further remark, the two constituents of the ointment must be rubbed up to a most intimate admixture, if it is to act well. The following are, then, the two formulæ :—

℞. Hydrarg. oxydat. flavi, gr. xxx. (via humida parati). Ung. cetacei, ℥ss. Misce exactissime et fiat unguent. ; or,

℞. Hydrarg. oxydat. flavi, gr. xxx. (via humida parati). Ung. cetacei, ℥j. M. exactiss. et. fiat unguent.

the vesicles form over the entire edge or surface of the cornea. As a rule, the formation of vesicles is limited to the cornea only, when the conjunctiva had been previously affected. The dependence on and relation to the conjunctival disease of any given purely corneal vesicle is perceived in the higher degree of redness and vascularity of the corresponding part of the conjunctiva; a pointed triangular leash of vessels running beneath the corneal epithelium very often forms the connection between the vessels of the conjunctiva. As the vascularity gradually invades the greater part of the corneal surface, we get the form of disease described by authors as corneitis vasculosa, scrophulous pannus, pannus phlyctenulosus. We very often see the disease represented by one single vesicle on the cornea, which runs the usual course, *i.e.*, passes into an open ulcer, as the epithelium, separated by the fluid in the vesicle, gets detached, after the vesicle has, as above remarked, become connected by a narrow leash of vessels with those of the conjunctiva. At the border of the ulcer next the edge of the cornea a fresh turbid swelling of the cornea ensues, and this, as it advances towards the centre, is continuously followed by the bundle of vessels, constituting one of the most obstinate corneal diseases, known as corneitis fasciculosa. These anatomical phases may, under certain circumstances, undergo further changes, either from local irritation, want of cleanliness, wrong treatment, or from constitutional predispositions, such as the lymphatic or scrofulous crasis.

Or from a continuance of such unfavourable circumstances, ulcers at first of very limited extent appear to spread in area, or even invade the deeper layers of the cornea, when we have to contend with corneitis ulcerosa, or corneitis profunda—forms to which the ointment is often inapplicable.

In the above briefly indicated forms of corneitis, every practitioner will, I presume, agree with me in recognizing one and the same type of disease that acquires its special form from the different kinds of irritation or structures in which it has originated. In all these forms I assert the yellow oxide of mercury ointment is a certain and almost specific remedy.

The good effect of the ointment is most displayed in the more chronic cases, after the originally greatly increased irritation of the cornea has somewhat abated, and the vascularization appears under the form of what is generally known as passive congestion. If the disease is in a more acute stage, the ointment may be applied from the very commencement, if care is taken to completely remove it from the conjunctival sac, as some may, from the spasm of the lids which is associated with the photophobia, get retained in the folds of the mucous membrane. The disease may possess the peculiarity of the phlyctenulæ

recurring. Fresh phlyctenulæ then form near the ulcers, always giving rise to increased irritation. Our attention is attracted by increased intolerance of light, lacrymation, and ciliary neurosis; an accurate examination then generally reveals small abscesses or phlyctenulæ. As soon as the abscess has, by breaking through the epithelial layer, discharged its contents, the previous state of quiescence at once returns. These intercurrent attacks must not deter us from continuing the application of the ointment; for it rather accelerates, than otherwise, the course of the disease. Only when the base of the ulcer is extending deeper than Bowman's layer, into the cornea-substance proper, must we exercise caution in using the ointment, and only try it in the first instance as a matter of experiment. If we, from the too long continuance of the stage of reaction, gather that the ointment irritates too much, we must wait for a day or two before trying it again. In such cases it is as well to employ also remedies of known sedative effect, such as atropine, a compress-bandage at night, warm fomentations of 35° R. for a few hours. It may also happen that superficial ulcerations of the cornea under unfavourable circumstances pass into purulent corneitis; purulent infiltrations in the layers of the cornea or hypopyon form, and, of course, here to apply the ointment is out of the question. Only after the purulent corneitis has passed into the reparative stage, may we again try the ointment, and may be surprised at the rapid regeneration of the corneal substance that ensues. The ointment is also an excellent means of clearing the cornea in all those exudations which persist after inflammations, especially in those cases in which the insufflation of calomel has hitherto been employed. I can further recommend it in mild cases of scleritis, limited to the superficial layers of the sclera (episcleritis) unaccompanied by any marks of irritation in the iris. In all the above forms of disease we may convince ourselves that the ointment acts favourably, more or less rapidly, and in but few cases is it necessary to employ any constitutional treatment in addition to the local. Purges are, as a rule, of no use, and cannot be recommended, for the reason that all weakening of the constitution must be avoided. Derivations through the skin, counter-irritants, blisters, act, according to my experience, injuriously rather than favourably on the eye-disease.

The frequent occurrence of conjunctivitis phlyctenulosa along with diseases of the skin, eczema, crusta lactea, lupus, and generally in persons with a very irritable skin, explains the above fact sufficiently, as the effect of this remedy is not counter-irritant or derivant, but the very reverse—to increase the already existing irritation. The patients require a more strengthening and tonic treatment, as they have often been

already too long kept for weeks in dark rooms, and prevented enjoying the fresh air. We order, therefore, above all, a good nutritious diet, going out into the fresh air, careful attention to the skin by cleanliness, cold water, and friction. These must be especially attended to. They materially assist the local treatment. If children suffer from great intolerance of light, giving rise to a nearly constant spasm of the orbicularis, I have often seen quite surprising results from suddenly dipping their faces in cold water, as recommended by von Gräfe.

The contra-indications of the ointment may be briefly enumerated, as they are easily self-comprehensible. As regards the other inflammations of the cornea, no good effect can be observed from the yellow oxide of mercury. Corneitis purulenta, blenorrhoica, or corneitis vasculosa, originating in granular lids and trachomatous pannus, generally get worse under it. In syphilitic corneitis parenchymatosa it has no effect one way or the other; but in the consequent obscurations of the cornea the ointment may be used, after all acute symptoms have completely vanished, to clear the cornea. If any iritis coexists, the ointment must be studiously avoided, as well as in all deep infiltrations and ulcerations of the cornea. I have often asked myself on what physiological fact the good effect of the yellow oxide of mercury depends; but must confess my inability to satisfactorily answer this question. Its immediate effect is undoubtedly irritant; for any previous vascularity is at once heightened on its application. The immediately increased flow of tears and disagreeable feeling of pain in the conjunctival sac, which are not perfectly explicable by its action as a foreign body, prove there is no necessity for the application remaining any length of time on the diseased parts to produce its effects. When the ointment is applied for the first time, the irritation may persist for several hours, till it gradually sinks to its previous degree, some, easily coagulating, mucus being at the same time secreted from the conjunctiva; a certain feeling of comfort even often ensues, which is attributable to the diminution of the extreme photophobia. On the second or third application, always observing an interval of four-and-twenty hours between each, the immediate irritant effect is already much less in degree and continuance than on the first. The eye gradually so accustoms itself to it that generally after it has been used for a week the re-action only lasts from a quarter to half an hour. It is principally the intolerance of light that markedly decreases, and *pari passu* the flow of tears. The mucous membranes lose their turgescence, partly by the vessels becoming diminished in calibre, partly by their disappearing altogether, and partly, also, by absorption going on in the swollen tissue itself, the mucous membrane acquiring a more dry appearance. The raw

exudation-surfaces, whether on the conjunctiva or cornea, lose their rough appearance; their yellowish colour gets more greyish-white; at last they become quite smooth; if they were deep in the substance of the cornea, they get more raised at their edges, and clear up. On the site of the previous ulcers a fascetted surface may remain for some time; that, however, as the corneal substance becomes regenerated, becomes smooth and covered with epithelium. This process agrees perfectly with the ordinary course of the healing of these ulcers; it is the rapidity with which we observe the regeneration and repair to take place under the use of the ointment that surprises us. As regards the photophobia, we possess in the yellow oxide of mercury an excellent sedative, due, it is true, to the previous brief irritation, just as we explain the similar action of nitrate of silver in catarrhal ophthalmia. Red precipitate has been long known as a particularly excellent application in indolent ulcers. The red precipitate in many cases irritates too much; but the yellow oxide of mercury, probably from its fine state of division, agrees better with the more delicate structures of the eye, and only excites that slight amount of irritation which is necessary to exert an alterative action on the diseased tissue, and, on the, perhaps exposed, nerves.

I must, finally, call attention to a very important matter, namely, the method of applying the ointment, as its results depend in great measure on this. The ointment is to be applied only once a day; best with a small brush, which is dipped in the ointment and applied between the eyelids; these, by their closure, rub off the ointment from the brush. If the ointment is properly made, *i.e.*, has the right consistence, it gets, by the movements of the lids, diffused over the whole conjunctiva and cornea, and then soon, by the same agency, extruded from the eye. It is best then to wipe it off with a piece of linen, lest it, by remaining too long in contact, create any undue irritation. If the movements of the lids are insufficient to completely remove it from the conjunctiva, we may try to effect this by gently rubbing the closed lids, and afterwards raising both the upper and lower lids from the surface of the globe.

Any ointment that still remains becomes then very quickly washed out by the tears. If the ointment is not well made, *i.e.*, if it does not melt at once on its application to the conjunctiva, some may remain in the reflection from the lids, and give rise to serious signs of irritation, from an extensive slough forming, and, as a consequence, a partial separation of the mucous membrane. It is, therefore, as well to inspect the conjunctiva again a few minutes after applying the ointment. On this account the ointment is better suited for patients on whom

the surgeon is in a position of watching its immediate action. However, I do not hesitate to give it to intelligent patients for them to use at home, after having instructed them in its mode of application, and the precautions to be observed in its employment. Cold applications after its use generally very quickly subdue the first somewhat violent signs of irritation. If the eye still exhibits any irritation after the expiration of one or two hours, it disappears after a walk in the open air.

I am convinced that every medical man will in proper cases recognise the efficacy of the yellow oxide of mercury.—*Ophthalmic Review, July* 1865, *p.* 116.

68.—VASCULAR CORNEÆ AND GRANULAR LIDS OF NINE YEARS' STANDING—CURE BY PURULENT INOCULATION AFTER PERITOMY.

Case under the care of J. Hutchinson, Esq., Metropolitan Free Hospital.

[The patient was a poor Irish girl of rather feeble health, who for nine years had had persistent ophthalmia, with granular lids, and vascular corneæ. The corneæ were completely covered by vessels.]

Mr. Hutchinson drew attention to the fact that it was in these cases that the measure was comparatively without risk—precisely the cases most needing it being those in which it could be done with impunity. The more vascular the cornea the greater the probability that no sloughing would follow, and *vice versâ*. In well-selected cases he had scarcely ever seen any harm result. Recently, it had been the practice not unfrequently to perform circumcision of the conjunctiva first, and then to inoculate a few weeks afterwards; and this was the plan he proposed to adopt. The following are the notes of the case:—

June 8, 1865.—B. S., aged 15, came to-day to report her condition, she having been discharged about nine months ago, and not seen since. It is just a year since her admission. She had then suffered from granular lids and vascular corneæ for nine years, and was only able to see the largest objects. She had been treated at various hospitals and with great variety of treatment. A week after her admission Mr. Hutchinson performed circumcision, removing a broad belt of conjunctiva around each cornea, and being very careful to clear away every trace of tissue down to the sclerotic. About six weeks later but little benefit was apparent. Both eyes were now inoculated from those of an infant suffering from purulent ophthalmia in a

moderately severe form. A fairly acute attack of purulent inflammation resulted, which was allowed to run its course, free ablutions only being resorted to. When the ophthalmia was subsiding a weak alum lotion was used. She left the hospital three months after her admission. At present date, a year after operation, both cornæ are clear, with the exception of a degree of haze so slight that it requires very careful examination to detect it. There is no vascularity of the conjunctivæ, and the granulations under the lids have entirely disappeared. She can see perfectly. The eyes are at times a little irritable. The belt from which the conjunctiva was removed has been so perfectly restored that it is almost beyond belief that such an operation was ever performed.—*Medical Times and Gazette, June* 17, 1865, *p.* 625.

69.—AN IMPROVED SPECULUM FOR THE EYE.

By J. Z. Laurence, Esq., Surgeon to the Ophthalmic Hospital, Southwark.

I shall briefly enumerate the disadvantages of the wire speculum in ordinary use for exposing the eyeball for operations, and the remedies I have introduced in my form of instrument.

1. The parts of the instrument which are directly employed in separating the eyelids are too short—they do not separate them in their entire lengths ; in my instrument these parts of the instrument are increased to about seven-eighths of an inch.

2. These same parts are straight ; in my instrument they are gently curved, in conformity with the natural curves of the palpebral sinuses ; thus any separate and unnatural dragging on individual parts of the eyelids is avoided.

3. Whenever the patient resists, more or less violently, by powerful spasmodic action of his orbicular muscle the separation of the eyelids by the wire speculum, the eyelids, especially the upper one, are forced down over or under the wires, so that the part of the eyeball exposed to view is materially diminished ; indeed, in certain operations (*e.g.*, those on the cornea, iris, and lens), more especially when the eyeballs are much sunken or small, the action of the wire speculum is practically annihilated.

This disadvantage I have met by substituting for the wires, which should separate the eyelids, grooves of metal—troughs, if I may so say—which receive the eyelids and absolutely prevent their overlapping, and thus contracting the surgeon's field of operation.

1. With the head-rest fix the head ; 2. With this speculum

expose the globe fully; 3. With bulldog forceps fix the eyeball itself, and you may operate on the most unruly subjects and children without assistants, without chloroform (where the nature of the operation does not specially indicate it), with the greatest ease and certainty. My own experience in all kinds of operations on the eye of the preceding method of securing immobility for the purposes of operation is most favourable. I now submit it to others less prejudiced perhaps than myself.

The "groove speculum" is made by Messrs. Weiss, 62, Strand, London.—*Med. Times and Gazette, June* 24, 1865, *p.* 647.

70.—A SIMPLE MODE OF EXAMINING THE FUNDUS OCULI.

By Dr. A. M. Roseburgh, Toronto.

I find that the fundus of the eye can be examined without the mirror of the ophthalmoscope as follows: The lamp is placed on a table in a darkened room. The patient is seated on a chair two or three feet from the table, and facing the light. The chair of the observer is placed with the back against the table and between the patient and the lamp. When the surgeon is seated, the lamp should be immediately behind the right shoulder and very nearly on a level with the eye. By now bringing the right eye in a line with the lamp and the eye of the patient, but so as not to shade it, if the pupil had been previously dilated with atropine—the fundus is seen to be illuminated. In order to see the details of the posterior internal surface of the eye, a lens of about two inches focus is placed within an inch or two inches of the eye under examination. An inverted image of the fundus can now be seen forming an aerial image about two inches in front of the lens.

The optic nerve entrance and the radiations of the retinal vessels can be seen by directing the patient to look at the light, or two or three inches farther from the surgeon's eye, but in the same horizontal line.—*Canada Med. Journal, Sept.* 1865, *p.* 106.

71.—ON CATARACT.

By Dr. A. von Graefe.

[Any preparatory treatment of the patient by the administration of purgatives is generally injurious. The atropine should be applied the evening before the operation. For six years previous to the use of the compress bandage, the upward section was always employed by Dr. Gräfe, but since then he has preferred the downward section. He says:]

My experience is, that there is no notable difference between the two, if equally well performed. The average duration of

recovery after the upward section is three days less (from twenty-one to twenty-four days in hospital); but as regards the percentage of prolapses of the iris, of iritis, or of suppuration, there is no appreciable difference. On the other hand, partial suppurations terminate more favourably after the downward than after the upward section, in which latter the gravitation downwards of the morbid products exerts a deleterious influence. In favour of the downward section we must further remark, that the operation itself is carried out more perfectly, in consequence of the greater rapidity and facility with which it may be performed, and of the surgeon being less dependent on the tractability of his patient, and on the assistance during it. The operator can avoid any rubbing or eversion of the flap by the eyelid, even in patients who have but slight control over the movements of their eyes. He can completely remove any remaining cortical débris without the necessity of introducing any instrument, and so forth. One may, it is true, with sufficient practice, bring the upward section to a successful issue, even in the case of sunken eyeballs, fractious patients, &c.; but the operation may be thus prolonged, or the apposition of the flap interfered with by the upper eyelid, even with the most skilful—all circumstances which add to the injury inflicted on the eye, interfere with the perfection of the operation, and are thus calculated, in doubtful cases, to turn the scale in an unfavourable direction.

As generally occurs in estimating the relative advantages of particular methods of operating, a variety of reasons have been advanced, pro and con, which, when tested by experience, are found to be for the greater part fallacious. Thus, for example, the downward section has been said to favour the escape of vitreous, in consequence of gravitation downwards. The reverse would be nearer the truth. Vitreous escapes, if the zonula Zinii or the fossa hyaloidea is burst. Such an occurrence is less likely to happen the easier the exit of the lens and of any cortical fragments is effected, as it undoubtedly is in the downward section. It has been further stated, that in case of any corneal cicatrices remaining, these impede vision more in the downward than in the upward section. No cicatrices of any moment, however, occur, excepting the case has gone wrong; either that the iris has prolapsed, or partial suppuration has occurred. In the former case the pupil becomes displaced, which is on the whole less desirable upwards than downwards; in the latter case the pupil is either closed or narrowed, and must, whether or no, be remedied by an iridectomy. It has also been urged against the downward section, that if the flap is not in accurate appositiou, the edge of the lower eyelid easily gets into the wound. Such a malposition is, however, certainly exceptional, and must be remedied, whichever method has been employed.

Either a portion of iris must be excised, or even some vitreous allowed to escape—operations which are far better performed after a downward than after an upward section. After a successfully executed downward section, the flap is so accurately adjusted that, even if the patient looks suddenly downwards, the lower eyelid does not cause the wound to open. Even in the case of abnormally protruding eyeballs, I am not at all afraid of extracting by the downward section, since I have methodically employed the compress-bandage. I do not mean to say I am a decided opponent of the upward section. It would be an injustice against the excellent results that have been obtained by many operators by that method, as it would be against my own previous experience.

I have myself before admitted that the medium duration of the healing of the wound is shorter after the upward section. This is caused by the winking of the eyelids keeping up rather longer some irritation in the wound after the lower section, it being covered by the lid in the upper section. I only wanted to direct attention to the fact that many of the so extravagantly vaunted advantages of the upward section are fallacious; that the real advantage of the method consists in the wound being equally covered by the upper eyelid during the first stage of the reparative process; but that this is in great measure replaced by the compress-bandage, and is hence counter-balanced by the greater quickness of performance and the less dependence on the patient that ensues in the other method. Assuming, what I will not contest, that, on the whole, both methods yield equally good results, still the easier performance of the downward section must always preponderate. At all events, I recommend every one—the practised as well as the unpractised surgeon—to operate on intractable patients by the downward section.

We operate on the patient usually in *bed*. Although the operator experiences a little more inconvenience in this position, still the patient has the advantage of being in the most complete muscular repose, and of being able to remain in the same position after the operation. Surgeons who operate upon their patients in the sitting posture are obliged, if anything unusual occurs during the operation, to make them lie down,—as in certain accidents, such as loss of vitreous *e.g.*, the horizontal posture is indispensable. The operation being on the right eye, the surgeon must sit behind the head of the bed, unless, indeed, he has the natural gift of being ambidexter, or, during the time of his professional education, in accordance with the now exploded whim of oculists, taught himself to become semi-ambidexter. Every one may follow his own taste. All we would do is to protest against such surgical display, and warn

those who still harp on being ambidexter, that to create mechanical difficulties, which may be very simply avoided, does not constitute a gain, but only shows a want of prudence. Surely no surgeon would be regarded as ingenious were he to amputate one leg with the right, the other with the left hand, instead of placing himself in the suitable position that would enable him to amputate either with the right hand. And in operations on the eye there is no difference, as long as the principle is adopted of operating on thepatient in the recumbent posture.

Immediately after the operation we apply the *compress-bandage*, which we are in the habit of employing in our practice. This consists in equably padding the orbit with picked lint in the form of little disks, over which a simple ascending turn of a flannel bandage is moderately tightly drawn across the eye. This is made fast by a turn round the forehead, half of which passes in front, half behind the ascending turn over the eye. The middle part of the bandage which passes over the eye is made (instead of flannel) of knitted cotton. The proper application of this bandage is especially important in collapse of the cornea. For the first few hours pretty firm pressure may be exerted, which must subsequently be gradually relaxed, so as not to check too much the escape of any discharge from the eye.

Is *opening the eyelids* attended with any danger? We are for deferring opening the lids in a case which runs a perfectly favourable course, till the fourth or fifth day, because it is, to say the least, unnecessary, or, under certain circumstances, even injurious. But if the case does not go on well, we should not hesitate to cautiously inspect the eye, so as to be certain in what condition it is. Supposing we found general suppuration, we should give up all hopes of saving the eye and confine our treatment to what best suited the comfort of the patient and his general constitution. But if suppuration of the wound was but partial, and prevented it uniting, our hopes would not yet be gone, and we should have to be guided in our treatment by narrowly watching its effects.—*Ophthalmic Review, Jan.* 1865, *p.* 313.

72.—ON THE REMOVAL OF CATARACT BY THE SCOOP METHOD, OR THE METHOD BY TRACTION.

By George Critchett, Esq.

[It is admitted by all that cataract occurring in persons who have passed the middle period of life should be extracted. This is generally done by the flap operation. In a considerable percentage of cases, however, imperfect sight and loss of sight occur. It is an interesting subject of inquiry therefore, whether there is any safer method of removing a cataract.]

The indications for the performance of a safe operation or rather an operation in which the elements of safety are most completely fulfilled may be stated as follows: to avoid as much as possible all the rocks upon which we may be said to split in the flap operation; thus the opening in the cornea should partake rather of the character of a slightly curvilinear slit than a semicircular flap, but it should be of sufficient size to admit the ready exit of the lens when gently drawn out by means of a suitable spoon. In the next place a portion of the iris should be removed so as to facilitate the exit of the cataract, prevent the possibility of prolapse, and diminish the liability to irritis and closed pupil. In the last place we must endeavour to remove the entire cataract, leaving no fragments behind, without, at the same time, bruising the iris or contusing the edges of the wound, and without rupturing the hyaloid membrane. If these indications have been carefully and efficiently carried out, every condition for obtaining a successful issue has been fulfilled, and the happiest result may be legitimately expected. Previous to describing the operation that is now adopted in a large majority of cases by some of my colleagues and myself at the Moorfields Hospital, and which I may state as one of the main objects of the present paper, I will endeavour to trace the various steps by which the operation has been brought to what I will venture to call its present advanced stage towards perfection. In the writings of Professor Graefe we find frequent allusion to the removal of a portion of iris as a desirable precaution in certain cataract operations. Thus in linear extraction, which was initiated almost simultaneously by Mr. Bowman in this country, and by the Berlin professor, the latter advises a removal of a portion of the iris in some cases as giving additional chances of success. In cataract complicated with old pupillary adhesions, he advises iridectomy previous to flap extraction. More recently he advised, in certain ordinary cases of flap extraction, that an iridectomy be performed some weeks previously, and still more recently he recommended that linear extraction should be applied to cataracts of medium density by introducing certain modification into the operation, and he removed in this way, with a scoop, cataracts through a large linear opening an iridectomy having been also performed. Having thus given an impetus to this important modification of the old method of flap extraction, the idea has been worked out in different ways by some of the more distinguished of his pupils on the continent, and also at the Moorfields Hospital by Mr. Bowman and myself. Thus Dr. Mooren took up the plan of performing a previous iridectomy, and then, at the end of five or six weeks, performed the ordinary flap extraction, he published a large number of successful cases, and urged the plan as meriting

universal adoption, and it is now associated with his name. Professor Jacobson combined the ordinary flap extraction with an iridectomy performed at the same time; in a similar way he supported his claims by a large array of successful cases, and his name remains attached to the method; and Professor Schuft (Waldau) worked out more fully the modified linear extraction, suggested a peculiar form of spoon, and published a paper in which the various stages of the operation are fully described, and the method supported by the citation of numerous successful cases. Thus suddenly appeared three new methods of operating for cataract, bearing the names of their several champions,—the method of Mooren, that of Jacobson, and that of Schuft (Waldau); but justice compels me to state that these gentlemen lighted their tapers at the torch of their great master, Professor Graefe. Each of these methods had been previously suggested and practised by him, but only in exceptional cases instead of as a general rule. It does not come within the scope of this paper to enter analytically into the respective merits of those three methods. The title of the paper by implication shews my bias in favour of scoop extraction; it seems to me desirable to avoid the formation of a large flap wound of the cornea, the disadvantages are obvious, and have been already alluded to in this paper; the only advantage to be placed on the other side of the question is the ready escape of the cataract, and if this can be accomplished as well through a curvilinear opening, as I have already said, there seems to me that a considerable advantage is gained. Soon after the publication of Schuft's (Waldau's) pamphlet, the operation was put upon its trial at Moorfield's, both by Mr. Bowman, myself, and others, and from that time until the present, with certain modifications, we have continued to perform it in an increasing proportion of cases, and during the last year I have exclusively performed scoop extractions. The operation performed at the present time by myself and that by Mr. Bowman differs somewhat, both in the mode of performance and in some of the instruments employed; I shall however confine my remarks to my own method of performing, and to a description of the scoop that I employ, and I have reason to believe that Mr. Bowman will add some remarks upon his method of proceeding, and his views as to the comparative value of the operations; remarks, I need hardly say, that must be most interesting and welcome to every ophthalmic surgeon. I find on reference to my note-book, that I performed my first extraction with Schuft's (Waldau's) spoon on the 17th July, 1860, at the Moorfields Hospital, and I continued to employ it until February, 1864, when I began to use the scoop that I now employ, and that is figured in this paper. My first few cases happened to be

very successful, but as my experience increased I was less fortunate ; I became more and more convinced that success depended upon great attention to the small details. I also became convinced that the spoon I was employing was seriously defective in form ; owing to its broad, thick frontage and to the sharply defined edge of its dish-like cavity, it was difficult to introduce and to insinuate behind the lens. The sharp edge had also a tendency to break up the lens into fragments, and to force some of these into the space behind the iris, where they remain fixed for a time and then become washed into the pupil, or on the anterior surface of the iris, or into the wound, and set up

FIG. 1. FIG. 2. FIG. 3.

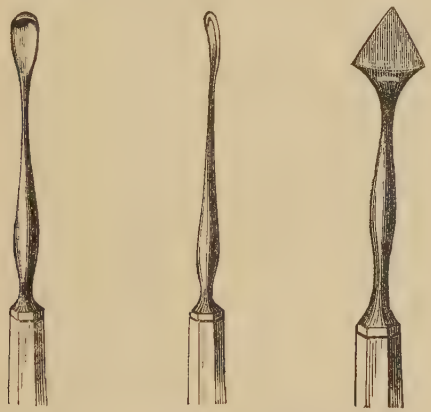


FIG. 1 and 2. Form of spoon employed by Mr. Critchett.
FIG. 3. Spear-shaped knife (Keratame) used for making the corneal incision.

serious reaction. Again, the edges of the spoon are very liable to bruise the iris and the edges of the wound, and in cases of hard senile cataract it was all but impossible to insinuate it behind the lens without displacing it, and risking a rupture of the hyaloid membrane, and even if this were accomplished, the bulk of the sppon, and the space that it occupied, added seriously to the difficulty of bringing the lens out through the corneal wound. The result was that some unfavourable cases occurred, and by degrees the operation fell into discredit, particularly on the continent, and was quite given up by several who were disposed at first to adopt it. This was partly to be attributed to defects in the instrument employed, and partly to errors in the mode of conducting the operation,—errors that

must necessarily arise in every new proceeding in which the details are not fully understood, and for which a special manual dexterity has not been as yet acquired; some fresh education being necessary even for those who were previously dexterous operators. Some of my cases, however, had made such a rapid recovery, had obtained such excellent sight, and had given me so little trouble and anxiety, that I became strongly impressed in favour of the operation. I was convinced that by carefully studying all the details of the operation, by making some alteration in the instruments used, and by avoiding the elements of failure, such as bruising and contusing either the iris or the edges of the wound, leaving fragments of the cataract still within the eye or in the wound, or rupturing the hyaloid membrane, better averages might be obtained and a more rapid recovery be brought about than in flap extraction. I was also convinced that it might be made applicable to every form of cataract for which flap extraction can be employed, including the hard amber senile cataract. Previous to describing the various steps of the operation it may be well to point out in what essential particulars flap extraction and the scoop method differ, and what are the principles and ideas that guide us in the various steps we take, and in the form of the instruments we employ. In flap extraction the idea is to make such an opening in the cornea as will allow the cataract readily to escape through it, either spontaneously or when gentle pressure is made on the globe. In the scoop extraction the idea is to make a wound of such a size and shape as will permit the transit of the cataract, but will not open so as to allow of its spontaneous escape, requiring for this purpose the use of an instrument to draw the cataract through the opening. This necessitates the employment of a suitable cutting instrument in order to make a corneal incision of the requisite curvilinear form; and, furthermore, a scoop of such a form as will glide readily behind the lens between its posterior surface and the hyaloid membrane, will occupy little space, will adapt its concave surface to the convex posterior surface of the lens, and on its withdrawal will so possess itself of the lens as to bring it out through the corneal opening, the edges of which are thus mechanically opened to allow of its exit. Hence it will be seen that although the escape of the cataract may be attended with more difficulty than in the flap extraction, when it is once accomplished the parts are left in a much more secure state, and the prospects of a speedy and complete healing of the wound are greater. I will now proceed to describe the various steps of the operation.

It is one of the advantages of the method of proceeding I am about to describe that chloroform can be given with safety. I

usually employ it, because a perfectly quiescent state of the eye and the absence of all spasm and involuntary squeezing together of the lids materially promotes a satisfactory performance of the different steps of the operation. Nevertheless, I have frequently operated without it, and with excellent success. In deciding this point I am partly influenced by the wishes of the patient and partly by the estimate I form of their probable behaviour. In forming an opinion on this latter point I am guided by various considerations, such as the strength of the orbicularis muscle, and the degree of irritability in the conjunctival membrane. This I usually test by gently manipulating the eye, touching the surface, straining open the lids, &c. It will thus be found that the sensitiveness of patients differs to a remarkable degree. A very correct estimate may in this way be formed of the probable behaviour of the patient during the operation, and I am very much guided by it in determining whether chloroform should be given or not. As a rule, however, I think that the various steps of the operation can be more completely and safely carried out, and that the chances of accidents and unfavourable complications can be best avoided by the administration of chloroform, and, therefore, I usually advise it. The first step of the operation is to open the lids fully with a wire speculum so constructed as to fix at any definite point and regulate exactly the degree to which the eyelids are separated. The eye must be fixed, and its position determined accurately by means of a pair of tolerably strong forceps. In doing this it is not sufficient to seize the conjunctiva; this easily tears and gives way. It is better to include the subconjunctival fascia, and even the insertion of one or other of the recti muscles, this enables you take a firm hold and to fix the eye in any position that may be most favourable for the performance of the subsequent steps of the operation. The eye being well fixed, the next stage consists in making the opening in the cornea—the size, form, and position of this are important—the incision must be slightly curved, forming a small segment of a large circle, and corresponding both in size and form to the curvature of the anterior surface of the lens or cataract. When there is reason to believe, from the appearance of the cataract, that the nucleus only is hard and the circumference is comparatively soft, the extent of the incision may be more limited, but in the senile hard amber cataract the incision must be of sufficient size to allow it to be drawn through entire. The incision must be made in the cornea about half a line from its junction with the sclerotic, and its extreme limits must trench slightly upon the junction of the sclerotic with the cornea in those cases requiring a sufficient opening for the removal of the entire lens. If the nucleus only is to be drawn out, a smaller

opening will suffice, and this may be kept within the limits of the true corneal tissue. The direction of the incision is also important. I usually make it at the upper part of the cornea because the upper lid conceals the wound and the altered form of the pupil, but where this consideration has no force it is rather easier to operate at the outer part of the eye, and the result, as regards vision, is equally good. In making the incision I employ the spear-shaped knife, curved at an angle on the flat, using rather a wider blade in those cases in which it is desirable to obtain a full-sized opening. The knife must be entered in the substance of the cornea, about half a line from its junction with the sclerotic, and must be carried across the anterior chamber up to the hilt, parallel to and just in front of the iris. This of course ensures an opening in the cornea equal to the width of the knife at its base or widest part, it also gives to the incision a slightly curvilinear form. If the incision is not of sufficient extent to allow of the ready exit of the cataract I sometimes enlarge it with a pair of fine, blunt-pointed scissors, preserving the direction of the curved line of incision. One of the most important points connected with the operation is the apportioning the size of the corneal opening to that of the cataract that has to be drawn through it. This is more especially the case in the hard amber cataract; serious embarrassment may occur if the corneal opening is not of sufficient size to allow the cataract readily to pass through it. Of course this apportionment can only be approximative, and no decided rule can be given, but with a little care and practice a very correct estimate may be formed. If, however, an error be committed, it is better to err on the side of having the opening too large than too small, as it is very undesirable to exert any force in drawing the cataract through the corneal opening. The next step in the operation is the removal of a portion of iris, for this purpose I employ a small pair of forceps bent at an angle, and with fine Asselini points. I usually remove only a small portion of iris; it seems to me to answer every purpose, and leaves less subsequent deformity of the pupil. A slight inconvenience that sometimes attends the cutting away a portion of the iris is the effusion of blood into the anterior chambers, obscuring the parts and impeding the subsequent stages of the operation. If, however, it is gently pressed out with the spoon of the curette before it has time to coagulate, it soon ceases. The next step in the operation consists in opening the capsule, this is done in the same way and with the same instrument as in an ordinary flap extraction, it is however desirable that it should be freely torn through, with the two-fold object of preventing, if possible, the formation of a secondary or membraneous cataract, and also to favour the advance

of the cataract out of its vitreous bed. In doing this care must be taken not to press upon the anterior surface of the cataract so as to risk the rupture of the hyaloid membrane. The next and perhaps the most important stage is the removal of the cataract; for this purpose I employ a spoon or scoop, which I have already described and figured; it is so constructed as to glide readily behind the posterior surface of the cataract; it is thin, flat, and concave, so as to adapt itself accurately to the posterior convex surface of the lens, and having passed completely behind it there is a small receding edge which holds the cataract, and as the scoop is gradually withdrawn, brings the cataract out with it, or such nuclear portion of it as is of sufficient density to escape entire. This part of the proceeding requires considerable care and some dexterity. In the introduction of the spoon through the wound, the back must be pressed gently against the posterior part of the corneal slit, so as to depress it and bring it on a level with the edge of the cataract, the anterior part of the spoon must then be inclined backwards so as to glide along its posterior surface, making its way between that and the hyaloid membrane of the vitreous humour. This must be done slowly and carefully, watching the anterior surface to see if there is any displacement, or if the instrument is passing safely and easily along. When the scoop has reached the further edge of the cataract it may be gradually withdrawn, the receding border will fix itself in the substance of the lens and bring it out through the corneal opening, or such portion of it as possesses sufficient consistency to pass through entire. Just as it is escaping peculiar care is required, as this is the moment when the hyaloid membrane is most liable to give way and some of the vitreous humour to escape. We must also avoid using any undue force or pressure, so that the surface of the iris and the margins of the wound may not be bruised or injured in any way. If (as may occur in those cases where the cataract is of the senile hard amber character) we find that it has escaped entire, the operation may be said to be completed; but if, as is more frequently the case, the nucleus only is drawn out, there is a residue of lenticular matter more or less considerable, varying in its consistence in different cases, and occupying not merely the pupil but the space between the iris and the hyaloid membrane, where portions are very apt to remain concealed. It is very desirable to remove these as far as possible from the eye, and for this purpose I employ, usually, a small spoon. When the pupil is cleared in this way, gentle pressure upon the front of the eye with the upper eyelid will often succeed in bringing fresh particles forward which may be removed in a similar way. It is important not to allow the spoon to touch the iris itself. I have not unfrequently observed that after

every care has been taken to spoon away every particle of opaque lenticular matter, and the pupil looks perfectly clear and black, if a few hours are allowed to elapse and the aqueous humour re-forms, the pupil will again be found filled with particles of the cataract. As this may become a source of irritation it may well admit of question whether it may not be desirable again to open the wound and remove these fragments. There are certain practical inconveniences attending this proceeding, but I can well conceive cases in which I should be disposed to adopt it. Great care is required not to leave any particle between the lips of the wound or so near the margin as to allow of its being easily washed into it, also to remove any little clot of blood or fold of conjunction that may separate the edges, and in this way interfere with primary union. I am inclined to think that many of the cases of suppuration of the wound are due to this cause.

The after-treatment I employ is usually of a very simple character. For a few hours, and as long as it feels agreeable to the patient, I apply cotton-wool soaked in cold water to the surface of the eyelid, and renewed as often as it becomes warm and dry. I also drop in a strong solution of atropine three times a day, so as to keep the pupil well dilated. If pain comes on severely, and if the lid begins to swell and redden, I apply leeches (six or eight) to the temple. It is just in the early stage of inflammation that leeches are usually of service. I also at this stage, if there be pain, examine the condition of the eye. If I find that fragments have come forward into the pupil and anterior chamber, or are pressing upon the iris, I sometimes endeavour to remove them, but unless this is done within 48 hours it is not attended with a satisfactory result. If purulent infiltration have commenced in the edges of the wound, extending between the layers of the cornea, and even into the anterior chamber, which is usually indicated by the state of the lids, and may be verified by an examination of the eye itself, I generally find warm applications more suitable than cold. It is in such cases that carefully applied support to the eye-lids, by means of cotton-wool (a method strongly recommended by Professor von Graefe), is especially indicated. A liberal diet is also required in such cases. It sometimes happens that the suppurative process can be arrested at this stage, and that some useful sight may be ultimately obtained, but much more frequently the purulent infiltration extends, and the eye is lost. With the exception of acute suppurative inflammation of the entire globe, it is the most serious and fatal sequel of this operation, and fortunately it is very exceptional and rare. It is, of course, difficult to trace accurately, or with any degree of certainity, the cause or causes of this form of trau-

matic inflammation. They are probably both local and constitutional, sometimes the former, sometimes the latter preponderating. If the edges of the wound are bruised, contused, or stretched during the drawing out of the cataract, or if any foreign body, such as blood or lenticular matter, remain in the corneal aperture, purulent infiltration is favoured. On the other hand, it sometimes occurs where we have good reason to believe that none of these causes have been in operation, and we are constrained te fall back upon some constitutional proneness to this form of inflammation. In some cases, doubtless, both local and constitutional conditions have combined to bring about this untoward result. We must at the same time bear in mind that it not unfrequently happens where both eyes have been operated on at the same time one has progressed most favourably, and the other has suffered from this form of purulent inflammation. In such a case we seem to be logically compelled to seek for the cause in some local conditions. A much more frequent result of this operation is the occurrence of iritis. This generally begins to show itself about the third day. It may be attended with severe pain, or it may be very insidious and painless. The pain is usually of a neuralgic character, radiating to the contiguous branches of the fifth pair. It may be attended with increased aqueous secretion, closure of the pupil, and abnormal hardness of the globe. Where this is the case, puncturing the anterior chamber often gives considerable relief, and this little operation may sometimes be repeated with advantage at intervals. Or again, the iris may be swollen and vascular, and the anterior chamber small. A third condition that not infrequently occurs is a peculiar bulging forward of the iris, with adhesion of its pupillary margin to the capsule, together with considerable recession of the adherent portion. This condition is also capable of relief by puncturing the cornea and iris, and restoring the communication between the anterior and posterior chambers of the eye. If this do not prove permanent, an iridectomy must be had recourse to. It sometimes happens that traumatic iritis is attended with severe pain of a neuralgic character, extending to the brow and the face, and taking the course of the branches of the fifth pair of nerves, sometimes occurring at irregular intervals, but not unfrequently assuming the periodic type. When this occurs it is a very painful and intractable complication. Locally soothing and warm applications, such as opiate fomentations, solutions of atropine, or belladonna, usually give the most relief. Blisters are sometimes useful, but leeches seldom benefit.

Constitutionally the indication would seem to be to sustain the powers of the system, and at the same time to quiet the nerves. A generous diet and a certain amount of stimulus

must be given; tonics, and particularly quinine, would seem to be indicated on account of the periodicity of the attacks. In many of these cases, however, I have been rather disappointed, and have failed to obtain any specific or immediate effect, even from the exhibition of large doses of quinine, the attacks being complicated, and kept up by the presence of local inflammation, the specific influence of quinine is not felt. I place my chief dependence in these cases upon the use of opiates, and by far the best method is the endermic. I usually am in the habit of injecting, under the skin of the brow or temple, a solution containing from a sixth to a third of a grain of the acetate of morphia. The effect of this is usually very speedy and very satisfactory. The pain subsides, a calm condition is induced, and a quiet sleep in most cases follows.

The influence usually lasts from eight to ten hours, and when it passes off the symptoms return, but the intensity is lessened. It may be repeated with advantage every twenty-four hours, until by degrees the pain and inflammation pass off. When traumatic iritis is very persistent and severe, it inflicts more or less permanent damage upon the eye. In some cases it extends to the ciliary region and the choroid, produces effusion between the choroid and retina, softening of the globe, and loss of sight. In less severe cases the pupil is closed, the iris thickened and altered in its structure, and its colour, and the anterior chamber diminished in size. Even in the slighter cases there is always partial closure of the pupil, and formation of a false membrane, filling up the pupillary space and obscuring to a considerable degree the sight. In the course of this paper I have endeavoured to show the advantages of the scoop extraction over the former plan, by means of a corneal flap. On the other hand, I feel that I ought in all fairness and candour to state as the result of my experience that iritis is more frequent after scoop extraction than when the old method is used; also that the occurrence of false membrane with adhesions is by no means uncommon, which vary exceedingly in the degree both of density and opacity, and also in other qualities. These secondary membranes often cause considerable disappointment to the patient and embarrassment to the surgeon, and many cases have come under my observation in which, either through neglect or mismanagement, permanent injury to the sight has been the result. As may be readily conceived, we have every shade of variety in these membranes, occupying the pupillary space. It not unfrequently happens even in cases that have in all respects made rapid and satisfactory progress, and in which the pupil looks black and clear, that when the sight is tested with suitable convex glasses, it does not reach the normal standard. Under these circumstances we may suspect the

presence of a delicate false membrane. It is often quite impossible to detect this with the naked eye, or with ordinary light. Sometimes it can be seen with the ophthalmoscope, using only a moderate degree of light and a weak lens; but the best, indeed the only sure way of detecting these thin semi-transparent membranes is by oblique illumination. By means of a three-inch lens the light of a lamp placed about three feet from the eye may be brought into a focus upon the pupil, and if this illuminated spot is examined through another lens the membrane can be distinctly seen like a fine piece of cobweb, with fine spots upon it. The tendency of this membrane is to become tougher and thicker. It can only be got rid of by means of a needle operation. It is important to determine at what period after the first the second should be undertaken. If, on the one hand, it is performed before all signs of irritation have passed off, it is very apt to light up fresh inflammation; if, on the other, it is delayed too long it is apt to become floating and elastic, and very difficult to disperse or tear through. I think it is better to wait until the eye becomes perfectly quiet, usually from about four to six weeks after the first operation. The pupil must be widely dilated with atropine, the lids being fixed open by means of the wire speculum. A fine needle may be passed through the cornea into the centre of the opaque membrane, and depressed so as to tear it through. If it gives way readily and freely, as is usual, then all that is needful is accomplished; if, on the other hand, it is elastic and moves with the needle, then a second needle must be introduced from the other side, as recommended long ago by Mr. Bowman, and by means of the two acting in two opposite directions, the membrane, however tough, can generally be torn.—*Ophthalmic Hospital Reports, Vol.* 4, *Part* 4, *p.* 315.

73.—ON THE EXTRACTION OF CATARACT BY A TRACTION INSTRUMENT, WITH IRIDECTOMY; WITH REMARKS ON CAPSULAR OBSTRUCTIONS, AND THEIR TREATMENT.

By William Bowman, Esq., F.R.S.

[Nothing can rival the excellence of the ordinary extraction operation for cataract, when all the dangers attending the healing process have been happily surmounted. The highest results cannot however be reckoned on with anything like certainty in any case, and a considerable proportion of cases turn out unfortunately, chiefly owing to the largeness of the flap. About five years ago, Von Graefe proposed to extract certain cataracts through a smaller opening, by excising the iris opposite the

wound, and making use of a spoon for the withdrawal of the lens.

It is evident that in all these earlier examples an *iridectomy* had formed no essential part of the proceeding. So far as I am aware, we owe to Von Graefe the first systematic combination of iridectomy with the use of a traction instrument, in extracting cataracts of a certain solidity through an opening, small in comparison with the old flap. In flap-extraction the large wound opens so readily to give exit to the lens, that this often bursts forth at the moment when the incision is being completed ; and usually, unless the pupil proves rigid, very slight external pressure on the eye suffices to expel it. But with the smaller incision no amount of external compression can force out the lens ; the iris and vitreous humour may escape, but the entire lens cannot do so. Hence it is a necessity, if the incision is to be of limited extent, to help out the lens on another principle, that, viz., of introducing a *traction-instrument* of some description within the eye, to take hold of the lens and draw it out, or at least to add this principle of traction to that of pressure applied to the exterior of the globe.

It would appear, that unless the incision is to be made into the posterior chamber, which on many accounts is inadmissible, such an instrument, however contrived, cannot be used with advantage, without a prevous removal of so much of the iris as lies across the track of the instrument. For otherwise either only the central pupillary area is available for the traction-instrument to work in, and this cannot, with safety to the iris, get thence into its requisite position behind the nucleus, so as to take hold of it, or else the instrument must pierce the marginal part of the iris, corresponding to the external incision, entering the lens out of sight of the operator, and almost unavoidably bruising the overlying iris, or dragging it out with the lens, so as to oblige its excision, if iritis is to be averted.

It might seem at first sight a bold thing to make the removal of a portion of the iris a condition of cataract extraction, thereby permanently altering and enlarging the pupil, when the flap-extraction admits of so easy a removal of the lens through the natural pupil, leaving the iris and pupil in their integrity ; and it is not surprising that this should have seemed to some minds a fatal objection from the outset to the new method.

But it had already become abundantly obvious to those who had practised iridectomy on a large scale, especially for glaucoma, that this enlargement of the pupil, especially if made upwards, need detract in no important degree from subsequent

acuteness of vision; and, as a matter of fact, it is certain that such altered pupils admit of the smallest test-types being read.

[Mr. Bowman does not wish it to be supposed that he is for altogether abandoning the old operation, for there are occasions when a number of circumstances will combine to give it the preference over every other. The author then proceeds to give the details of the traction method, the object of which operation is to get away the whole lens, through a small opening, with the necessary sacrifice of only that portion of the iris which lies in the track of the instrument.]

Chloroform should generally be given, and if given should usually be given fully, so that the eye remains quiescent throughout the operation. When it seems desirable to administer as small a dose as possible, I often make the preliminary incision and the iridectomy under its partial influence, reserving its full effect for the most critical period—the introduction of the instruments which have to deal with the lens,—a period lasting perhaps only a few seconds.

Operation.—If the pupil is small and rigid, atropine may as well be applied previously, otherwise not. The patient lies on his back with the face upwards, and his feet towards a window. The operator stands or sits beyond his head, which is slightly inclined towards the light, uses the wire stop-speculum for the lids, and fixes the eye with forceps, which take hold of the tendon of the lower rectus precisely in the middle, close to its insertion. He then rolls the eye downwards with care, not at first either to compress or to pull upon (I do not mean to rotate) the globe, for to pull upon it is really to compress it. The holding forceps should be slightly toothed, so as to seize the tendon readily. To seize the tendon, or at least the subconjunctival tissue, and not the conjunctiva only, is to obtain a perfect hold on the globe; the conjunctiva alone may tear away, or by sliding on the globe may render the forceps no longer the guide they should be to the point of incision, by being precisely opposite to it; for the eye, in being held downwards, is usually somewhat rotated on its anterior-posterior axis. During the act of iridectomy, unless the eye is quite and lies well, I generally give the fixing forceps to an assistant, taking them again into my own left hand while the traction instrument is being used with the right hand.

As to the incision. *Position.*—The iridectomy should be usually made directly upwards, both because it will not be visible afterwards, and because, being covered by the lid, it will the less detract from the optical perfection of the organ. The lower or central part of the resulting pupil will be that used in vision. It is perhaps a little less easy to execute the steps of

the operation when the upward direction is chosen, but if the eye is rendered passive by chloroform, and the globe rotated sufficiently downwards without being compressed, no real difficulty need occur.

Shape.—The lancet-shaped knife (which should be slightly bent on the flat, and of which the cutting edges should meet at an angle of about 50° or 55°) should enter the extreme margin of the anterior chamber, and be pushed on with its flat parallel to the iris, until its point reaches the opposite rim. It is then gradually withdrawn, and as the aqueous flows slowly away it may be made to enlarge the wound at one or both angles, if requisite. In withdrawing it the point may incline to one or other side of the chamber, so that the lens should not incur risk from the point traversing the pupillary space, in case of any sudden, unexpected movement of the eye. This is a good precaution in all cases of iridectomy, but, of course, all the more important when the lens is transparent, and not to be involved in the operation.

The wound thus made is curvi-linear, and follows the rim of the chamber, passing through the corneo-sclerotic junction. It cuts this tissue not vertically, but in a plane about parallel to the iris, and its middle part and ends are in the same plane. As it need hardly in any case occupy more than a fourth of the circumference of the cornea, the effect is that if the globe is compressed by the lids, or if the vessels of the eye become turgid under the chloroform or afterwards, so as to occasion internal distension, the wound hardly gapes, it rather closes; whereas if the eye is slackened, the hinder or sclerotic lip is easily pushed back, and the anterior or corneal lip forwards, by the traction-instrument inserted, so as to allow blood to escape from the chamber, and to give ample room for even a bulky lens to emerge under the guidance of the tractor. The incision thus made is near to the equator of the lens, which is thus more easily dealt with by the tractor, and fragments of it do not easily elude the instrument by slipping up behind the posterior lip of the incision.

The incision is faulty in direction if its ends leave the line of the corneo-sclerotic junction and curve into the cornea. It then describes an arc of a smaller circle. The flap formed is less roomy for the exit of the lens, and yet it is more disposed to gape and lie unevenly; moreover, the iris is less perfectly excised at the angles. It is more exposed to be bruised there, and lateral fragments of the lens to be entangled and left in, occasioning irritation afterwards. This faulty form of flap is familiar to operators by the old method, when the incision has not been a happy one. The *direction* of penetration should be

the same at all parts of the incision, viz., from first to last in a plane nearly parallel to the iris, and just in front of it.

Extent.—A judicious operator will vary the extent of his incision by his estimate of the probable size of the firm cataractous substance which has to pass through it, always taking care that the opening is *large enough*. It is far better to have it too large than too small, and it is particularly desirable that it should be ample in such old cataracts as are supposed to have their margin easily detachable in small segments. For one of the disadvantages of this traction method is the liability to have the sides of the lens separated and left behind near the angles of the wound, giving rise to subsequent irritation; a too narrow path of exit disposes to this, and in such cases an incision of nearly one-third of the corneal circumference, especially when the cornea is small, is desirable. In old cataracts that have had formerly a softened surface, the remains of this seem often to accumulate at the equator, where they undergo fatty degeneration, and readily break off in chippy fragments.

Where the whole lens is firm and of nearly equal consistence up to the margin, as in some old cataracts, and also in those of slow progress in middle-aged persons, which have commenced with striæ near the surface, the opening should be proportioned to the size of the cataract, so as to give it room enough to emerge; but the largest-sized opening is nevertheless not required, as the margin of the lens does not break off, and the whole admits of being drawn out entire and with safety through an opening comparatively small.

The cases for which the smallest incision will suffice are those where we may be pretty sure that the nucleus, if hard, is small, and the surface of the cataract diffluent, or pulpy, or semi-fluid. The opening is then made to suit the size of the nucleus, it being certain that the surface matter, though abundant, will be effectually got out easily through the same channel. But it is important here to have regard to the exact consistence of this surface matter. For though very soft it may not be so loose and diffluent as to flow easily from behind the iris into the pupillary space, and so out at the wound, but on the contrary, it may be glutinous, adhesive, and semi-transparent, and therefore much more apt to remain within the chamber if the harder nucleus has to emerge through a narrow wound, through which it can only come stripped of its surface matter; whereas if the opening be ample, the surface matter or the greater part of it may be made to emerge with the nucleus, without being much detached from it, if care be taken in using the scoop.

When it is wished to make an opening of the largest size, this may be best effected by enlarging the wound at one or both angles on withdrawing the knife, and to do so has the addi-

tional advantage of making the inner aspect of the section as wide as, or wider than the outer, which a lance-shaped instrument, if allowed to cut only in entering, could not accomplish; and this shape of the wound, irrespective of its mere size, is probably favourable to the escape of lens-fragments. Even if the knife has to be re-introduced, I prefer it to the scissors, which are apt to cut too much within the corneal margin, and not in the same plane as the knife has done; moreover, they cannot be made to cut conveniently at either angle indifferently as the knife can do, without the operator changing his own position; and I also think them more likely to bruise the iris.

As to the Iridectomy—In dealing with the iris in this operation, the great object is to secure the eye against inflammation of that part of the iris which remains. If the nucleus of the lens is small and the surface of the cataract diffluent, so that the extraction by a small opening is easy, and the risk but slight of small glutinous or hard fragments remaining behind, the iridectomy need not be large. In some such cases I have so managed as that the pupil has remained afterwards nearly circular, the pupillary margin having been rather divided than excised, the iridectomy involving chiefly the upper part of the membrane. No doubt the less excised the better in an optical sense. But a far more essential thing is to secure the eye against inflammation of that part of the iris which remains; no portion of this should be on any account contused or rubbed against either the lens, the cornea, or the instrument. It is much better therefore to excise widely than by removing a smaller piece to hazard the bruising the edges of the remainder during the movements of extraction. It is better to err, if at all, on the side of an ample excision. The margins of the cut part are then also not so liable to entangle fragments so easily, or to become irritated by their presence if retained.

The iris is seized by the small curved forceps, drawn out, and snipped off by scissors. I used to leave its ciliary border, but I now much prefer to excise its whole breadth, as being the safer method. What remains is less on the stretch, yields more, and is less apt to become inflamed; moreover, with care there is then no greater risk of the escape of vitreous. The mode of seizing with the forceps influences the amount excised. If a small excision is desired the blades should open very slightly and seize that part that lies opposite the centre of the corneo-sclerotic incision, and which is midway between the ciliary and pupillary margins, and it should not be drawn out much before the scissors are applied. If a large excision is intended, the blades of the forceps should open more widely, and the iris may be dragged out further, and be thus torn

from the ciliary attachment to the required extent before being cut off.

It may be cut off by a single movement, or divided first in the middle and then at each angle of the wound separately. A method, which I think a good one, and generally follow now, is to seize it and tear it a little from its ciliary attachment near the right-hand angle of the incision, and cut it across there on the right of the point held by the forceps ; then tear it away as far as the opposite angle of the wound, and cut it across there also. By pulling it out at the angle of the wound, before cutting it off, the ciliary separation and the iridectomy may in this way be easily made more wide than the incision itself, which in some cases is advantageous, and is always safe, since the cut margins of the iris recede well away from the track of the instruments dealing with the lens, and cannot lie in the angles of the wound afterwards. I think it likely that when iritis follows this operation it is often an extension of irritation either from the ciliary edge of the iris left remaining at the site of the iridectomy, or from its cut margins bruised by the tractor, or entangled in the angles of the wound.

If blood flows into the chamber so as to disguise the iris and lens, either before or after the iridectomy, I prefer waiting till it ceases to flow, and to remove it, before proceeding with the next step. It should be removed as it flows, and before it coagulates, by inserting the point of the curette, if necessary, between the lips of the incision, while the forceps holding the lower rectus tendon, slightly pull or compress the eyeball.

It is not often indeed that blood does flow to an extent to require this, but if it do, and is left in, it obscures the view, and thus not only renders the succeeding steps less delicately exact, but makes it less easy to spare the remaining iris from all injury, and to withdraw loose fragments of lens. Hence I insist upon this point of practice.

Opening the Capsule.—The next step is to open the capsule. This is done with one of the ordinary flat-ended prickers used in flap-extraction. I have only to intimate the extent of the opening and the precautions to be taken. The object is so to open the capsule as to destroy or effectually tear through *all* that part which lies in front of the attachment of the suspensory ligament, but to save the suspensory ligament, and all the capsule behind it, as a safeguard to the vitreous humour. Opening the capsule thus freely facilitates the escape of the marginal lens-substance, and also lessens the chance of subsequent so-called capsular opacities in the pupil. Such opacities often depend on portions of the anterior capsule rolling up and enclosing its lining of cells or even portions of superficial lens-substance, and if the membrane has not been (so to say) com-

minuted, but only split open in one or two directions, these opaque portions are apt to form bands standing across the pupillary area, the too limited orifice made in the capsule at the same time contracting as the whole capsule falls somewhat together centrally towards the pupil.

If the opening has been made by comminution of the capsule, but to a too limited extent, corresponding perhaps only to the middle third of its area, or to the pupillary area at the time of operation, and has not been carried behind the iris as far as the vicinity of the suspensory ligament, the margin of the orifice is very apt thus to rise afterwards across the pupil, and to require to be dealt with on a subsequent occasion.

The pricker should therefore be at first passed flat behind the iris to the farthest part intended to be opened, then its point should be turned into the lens there and brought up with slight movements, first on one side, then on the other, comminuting the capsule in its course within the line of attachment of the suspensory ligament, under cover of the iris. It may then be made to tear the central part, and finally that part nearest the external incision, where the traction-instrument is about to be inserted.

Here it may be moved a little more freely, so as to break open a way for this instrument at the upper edge of the nucleus, especially if the nucleus is large, or its surface adherent to the capsule. It is essential that the pricker should be used with a light touch, that the iris should not be bruised, and that the body of the lens should not be pushed backwards or sideways by it, lest the vitreous should be burst into. The operator should bear in mind the delicacy of the sustaining tissue, and that his object is to lay open the capsule properly, without any displacement of the lens. To ensure this in the greatest degree, I always take care that the chloroform at this critical moment has made the eye quite motionless, and I hold the eye myself with the forceps both at this period of the operation and during the use of the tractor.

I attach considerable importance to another point of practice, viz., the loosening of the body of the lens from its capsule before introducing the tractor, whenever, either from the immaturity of the cataract, or the large size of the nucleus, and absence of superficial soft matter, unusual difficulty in the introduction of that instrument might be expected. In tearing open the capsule the condition of the lens in this respect is probably ascertained. This loosening I effect either by the common pricker or by the fine needle already referred to (having the point bent at a right angle), which has long been in use at Moorfields, for pulling out the lens in ordinary flap-extraction, when it refuses to escape in the ordinary way, or has dropped

back into the vitreous humour. The point of this is thrust back into the lens-substance near the margin (and particularly without pressing the lens backwards towards the vitreous, which might force this humour out through a rupture of the suspensory ligament) so as to get a hold of it without displacing it, and then the body of the lens is slightly rotated on its antero-posterior axis to and fro within the capsule until it is felt to be loose. In immature cataracts the loosening is often attended with a sudden falling forwards, which at once explains itself to the operator.

I have come to adopt this method in certain cases, from having witnessed the failures not infrequently attributable to the difficulty in passing the tractor behind the nucleus, when the body and capsule adhered. Every operator knows how much the risk of the ordinary flap-extraction is augmented by this adhesion of the body to the capsule in immature cataracts. The lens escapes with difficulty—more pressure on the globe is required to expel it—and portions of it are very liable to be left adherent to the capsule behind the iris, where they become a fruitful source of irritation afterwards. The same risk is incurred, but to a much less extent, where iridectomy is practised. As circumstances often are urgent against delaying operation till the cataract is more complete, I think in such cases, when the traction operation is chosen, this little proceeding is a useful addition to its safeguards; and it might be applied also, where called for in flap-extraction.

While opening the capsule the operator at once learns the consistence of the cataract with which he has to do, and knows better how to deal with it in the subsequent steps. If soft matter is abundant around the nucleus, and sufficiently diffluent, it is well to allow some of it to escape at once by the wound. Slight pressure on the globe facilitates this, and thereby more room is afforded for the traction-instrument within the eye.

The *use of the traction instrument* has next to be considered. The *course* it has to take,—at first backwards and then downwards, so as to embrace the nucleus,—has to be estimated with exact reference to the shape, size, and position of the lens, and it is by no means difficult for a young operator to commit an error in this respect. It must pass between the nucleus and capsule without pushing the nucleus from its place, and without breaking into the vitreous humour, or bruising the iris, and if the nucleus be not already loose from the capsule, one or other of these accidents may happen very easily. The more blunt or obtuse the end of the traction-instrument, the more likely is it to displace the lens in the attempt to get beyond the nucleus, and it is particularly apt to do so if it be pushed on too rapidly, or if it do not dip sufficiently behind it.

[Mr. Bowman here describes his spoon-like instrument, which differs a little from that of Mr. Critchett.]

The body of the spoon is very nearly flat from side to side, a little concave forwards from end to end, and the incurvation of the extreme end is in fact a continuation of this concavity, though inclined to it at an obtuse angle. Where the end joins the sides of the spoon this incurvation gradually ceases, and the sides, except towards the end, have no edge above the general level. The whole is as thin as possible consistent with due rigidity, and the breadth about half or a third that of the lens. The stem is slightly curved, to adapt it to the position of the brow, across which it has to work in the ordinary iridectomy upwards.

I have found a spoon thus constructed to be very suitable in the great majority of cases, to be easy of introduction and manipulation, and also to take excellent hold of the nucleus when the handle is properly depressed at the right moment. It is also useful in withdrawing loose fragments after the main bulk has been got out.

Another modification of shape, however, seems even preferable where from the entire absence of soft surface matter there is the least room for the insinuation of an instrument between the lens and its capsule, and where therefore it should occupy the least possible space. This form is nearly flat from side to side, and but slightly concave from end to end.

It is, of course, better to extract all fragments if it can be done with safety, and I may here mention my *suction-syringe*, with a larger orifice than usual, as of great use in this respect. Fragments which refuse to be brought out by the curette or spoon will often be completely manageable with the syringe. The sucking orifice admits of being turned in any direction, so as to seize such fragments without interfering with the iris at all.

[The after treatment does not demand any special remarks. It is generally more simple and attended with less anxiety to all concerned than that following ordinary extraction.]

On the whole, the experience I have acquired induces me to draw the following conclusions:—

1. The operation described may be applied to all cataracts of harder consistence than those which admit of being withdrawn through a puncture of the cornea.

2. The iridectomy, which is a necessary part of it, is no disfigurement, nor does it in any important degree affect the optical result.

3. This operation is superior to flap-extraction by being applicable under chloroform, by its diminished risks during convalescence, and by its greater average success, and by

being now and then admissible where flap-extraction would be attended by so little prospect of advantage as to be hardly worth performing.

4. While therefore flap-extraction may still be preferable under certain circumstances, and while it may be open to the future to render its success more secure under various conditions, a general adoption of the traction method would be likely, at present, to add considerably to the percentage of cases of cataract in adults recovering sight by operation.—*Ophthalmic Hospital Reports, Vol.* 4, *Part* 4, 1865, *p.* 332.

74.—ELECTRO-THERAPEUTICAL AND PHYSIOLOGICAL RESEARCHES ON PARALYSIS OF THE OCULAR MUSCLES.

By Dr. Moritz Benedikt, of Vienna.

When, at the suggestion of Professor Arlt, I first undertook the treatment of paralysis of the ocular muscles by electricity, I soon convinced myself that the production of contractions of the paralyzed muscles was not necessary to a cure, and was not often possible. I soon convinced myself, also, *that the cure was dependent, generally speaking, upon reflex excitation through the fifth pair of nerves, and not upon direct excitation of the nerves supplying the muscles themselves.* In most cases, *a curative action was only produced when the excitation was relatively weak,* and when no trace of muscular contraction was produced by the electricity. If, for example, during a sitting, an increase of mobility became apparent, and the operator then applied a strong current, the improvement forthwith diminished. *The proper measure for the strength of the current is always furnished by the sensitiveness of the fifth pair.* For example, in a patient suffering from complete paralysis of the third nerve, improvement first appeared when the battery was reduced to three of Daniell's elements. The fifth on this side was very sensitive. In patients with abnormally insensitive trifacial, it is often necessary to use fifteen elements before any benefit is obtained.

The intensity of the current must be such as to produce slight sensation in the parts excited.

These data prove that we have not to deal with a physical current, acting upon the nerves of the ocular muscles, in which case these would be independent of the degree of irritability of the fifth nerve; but with a physiological reflex excitation, having its course manifestly through the ganglia of the spinal cord, the connection of which with the ganglion of the fifth is partly anatomically proved, and partly rendered probable by analogy.

According to my observations, the results of electrical excitation of subjective visual and auditory sensations are wholly analogous to the above. Their occurrence and intensity always bear a direct relation to the sensitiveness of the trifacial.

A third important principle in the electrical treatment is that the *excitation should only continue a very short time* (about half a minute) at each sitting.

The operator may easily convince himself that, when improvement becomes manifest under the influence of very feeble and soon discontinued excitation, this improvement will be endangered if the excitation be continued. I therefore usually excite for a few seconds, then test for improvement, and then excite again, until I observe that the improvement ceases to make progress, when I abstain. *In the greater number of cases the improvement takes place instantaneously.* When no immediate improvement occurs, a longer continuance and increased strength of excitation is not indicated. In the curable cases dangerous longer and stronger excitation. I have myself improvement occurs, after some time, by the repetition of excitations becoming weaker and shorter at each sitting; while by longer and more powerful excitation the original paralysis may easily be aggravated. In the rare cases in which, after sufficient perseverance, no improvement is gained in the manner described, it is useless to practise the hitherto always used the galvanic current. That the operators who use Faradization have, in general, hitherto obtained no very gratifying results, is probably due to their having attempted to act *directly* upon the ocular muscles, as well as to the undue continuance and excessive power of their applications. Whether the principles above laid down would lead to the successful use of Faradization also, can only be ascertained by a parallel series of experiments. *The improvement in most cases occurs instantaneously, and is chiefly shown by an increased mobility of the eye, and by a diminution of the field in which double images arise.* At the beginning of my researches I believed the above to be an invariable rule in curable cases; and I discontinued the treatment whenever no improvement was obtained during the first eight days. I was taught better by the case of a medical man from Cracow. He suffered from paralysis of the third nerve following a severe cold; and under ordinary treatment making but little progress towards cure—Professor Arlt sent him to me. Although some part of the contractility of the paralyzed muscles was then restored, the patient saw double in the greater part of his field of vision; and during the first fourteen days no improvement was prodnced. *All at once the region in which double images were visible became greatly narrowed,*

although the power of moving the eye by means of the affected muscles underwent no increase. Subsequently, however, this power improved, and the patient made a complete recovery. When the paralysis has been unaffected by fourteen days of treatment, I have, as yet, seen no benefit from its longer continuance.

In order to assign a marked effect to any therapeutic agent, it is necessary first to inquire whether it will, with any certainty, effect a cure in cases that have resisted other methods of treatment; and also whether cases that have not been cured or improved by it, may be cured by other means.

In respect of vesicants, strychnia, secale cornutum, vapour baths, and section of the antagonistic muscles, I possess no little experience, since a large part of my cases were brought to me after these more common methods had proved of no avail.

I have at present succeeded in curing, or in greatly improving, many cases in which the above-mentioned remedies had been applied without result; and I have not hitherto met with a single case, that resisted electricity, in which these remedies have afterwards effected a cure. With regard to the treatment by iodide of potassium, I have not sufficient material to institute a similar comparison.

The next question is, whether certain branches of the trifacial nerve bear a definite relation to the motor fibres; that is, whether the excitation of only some sensitive twigs will be followed by the restoration of mobility. With regard to this, I have tried experiments in a spirit of pure empiricism; and have based upon them the methods following:—Paralysis of the abducens is best treated by placing the copper pole upon the forehead, and moving the zinc pole over the neighbourhood of the cheek-bone. In mydriasis, the copper pole should be placed on the closed eyelid, and the zinc pole applied as before. In ptosis, the copper pole may be either upon the forehead, or may be applied, by means of a short catheter-like rheophore, to the mucous membrane of the cheek, while the zinc pole is drawn over the lid. For all the other branches of the third nerve, the copper pole is applied as above. Then, in order to act upon the rectus internus or obliquus inferior, the zinc pole must be drawn over the skin of the side of the nose, near the inner angle of the eye, and, in order to act upon the rectus inferior, over the lower margin of the orbit.

In paralysis of the superior oblique, I have succeeded best by placing the copper pole on the forehead, and by drawing the zinc pole on the inside of the nose, near the internal angle of the eye.—*Ophthalmic Review, July* 1865, *p.* 143.

SYPHILITIC DISEASES.

75.—ON SYPHILIZATION.

By Professor Boeck, Christiania.

[M. Ricord says "Syphilis is certainly one of the diseases over which medical art has the most power." Professor Boeck's experience is that the mercurial treatment gives the worst and most melancholy results possible. He says:]

"Syphilis is certainly one of the diseases over which medical art (mercury) has the *least* power." But we do not want opinions; we want facts: and I have therefore, in my work "Recherches sur la Syphilis" (Christiania, 1862), collected all the cases of syphilis treated in the hospitals of Christiania from the year 1826 to 1856; and I shall here repeat the principal results, and add the information that has been communicated to me since the appearance of the said work.

Patients to the number of 3561 have been treated for constitutional syphilis, and of these 3087 have been treated with mercury. Of these 3087, 978 have had relapses, or nearly 32 per cent., many of these having had more than one relapse; the total number being 1532, and the average time of treatment for each patient having been about 125 days.

However, it is not the time required for the treatment, nor the number of relapses, that forms the principal question when we talk about mercury being advantageous or injurious as a means of cure for syphilis: it is the general health of the patient after the treatment. I have done all I could to ascertain the patients' fate in later years, but this, as may be supposed, has been no easy task, and out of the 3087 I have been able to trace only 655. The principal diseases from which these have suffered are as follows: Paralysis, of which 18 individuals have died, and from which 32 are still suffering; 9 have been attacked by paralysis after treatment, but have been cured: this makes a total number of 59 attacked by paralysis, and one is at this moment suffering from ataxie locomotrice progressive. 8 have died from, and 2 are being treated for, paralysis generalis. 42 have died from, and 17 are being treated for, phthisis. 9 have died from, and 1 is being treated for morbus Brightii. 4 have died from, and 6 are being treated for, mental alienation; 3 have been cured. 52 persons have died from different chronic diseases; the average length of time that has elapsed before death after their treatment for syphilis has been about twelve years and a half. 56 have died without my having been able to ascertain from what disease; the average length of time that has elapsed before

death after their treatment was fifteen years and a half. 186 persons are still in apparent good health. With respect to further details I must refer the reader to the above-mentioned work.

I do not mean to say that all these cases of paralysis, paralysis generalis, &c., are the inevitable consequences of the preceding syphilis; but I affirm that among 655 individuals who have not had syphilis you would not find by a long way such a percentage of these diseases. If anyone still believes that mercury deserves any credit, I would just advise him to go into an hospital for syphilitic patients, where old cases are treated as well as recent ones, and they would find plenty of fallen noses, open palates, caries in several of the superficial bones, and many of these persons also in a cachectic state.

It may, perhaps, be said that the treatment in the hospitals of Christiania may have been bad, that mercury may have been given in too great doses, &c. I have treated but very few of the aforesaid patients myself, but the treatment has been going on in my time and I can attest that it has been conducted with the greatest care and by skilful men. The fact is, the same results would be found everywhere if they could only be traced. But in most cases a physician in a large town cannot control his patient after the treatment; he does not even know whether he has a relapse or not, for he who has a relapse generally consults another medical man rather than return to the one who treated him for the first affection. Still less will he be able to know if his patent is afterwards attacked by another disease in consequence of syphilis; because, if he should get paralysis, or disease of the liver or kidneys, he will never think of consulting the same medical man that treated him for syphilis. Lest I be misunderstood, I will at once state that I by no means consider the diseases that arise after syphilis treated with mercury as mercurial diseases, as some people have done of late. They are all, in my opinion, consequences of syphilis, and may appear after any treatment whatever, as well as if no treatment has been used at all. On the other hand, experience has most decidedly proved to me that relapses are more frequent and of more redoubtable appearance, and the above-mentioned chronic diseases oftener take place, in cases where mercury has been used. I am prepared to find that the majority of my readers will differ from me in this opinion, which, however, I believe I have sufficiently sustained by facts; but experience has shown me that there is always a strange blindness prevailing with regard to the destructive effect of mercury. More than once, when I have gone to see services for syphilitic patients, individuals have been shown to me that were perfect human wrecks, without nose, without palate, or

with exanthematic or serpiginous affections that were devouring the body in a most fearful manner, and at the same time I have heard no end of praise of the excellent effects of mercury, and decided condemnation of syphilization.

I commenced practice as a medical man, as already stated, in a circle so small that it was easy for me to observe my patients afterwards, and to become aware of the disastrous effects of mercury when used against syphilis. Accordingly, when I went to the University of Christiania, where I lecture upon syphilis, and also have a service at the hospital for syphilitic patients, I thought it my duty to try syphilization, however great a paradox it seemed to me; and I shall now, after this introduction, explain my proceedings a little further.

In my last paper I gave a brief account of the principal phenomena occasioned by continued inoculations with syphilitic virus taken from primary ulcers, laying special stress upon the fact that after continued inoculations the organism enters into a state of immunity to this virus. By going on inoculating a period will be arrived at when no more effect will be seen from inoculation of the syphilitic virus. The organism has, during two or three months' time, gone through a cyclus with respect to the reaction against the syphilitic virus, and will afterwards never go back to the state in which it was with regard to that virus before the inoculations were begun. This is just the point of the matter. Here we find an analogy with all the the acute exanthems. He who does not look upon syphilization from this point of view ought never to practise it.

It was this analogy with the acute exanthems which led the discoverer of syphilization, M. Auzias-Turenne, first of all to propose its employment as a prophylactic, like vaccination. This suggestion, however, met with a perfectly justifiable opposition, which did not cease even when he gave up that idea, but which exists to this day in nearly its full strength. From the moment I commenced practising syphilization I always most decidedly objected to its being used as a prophylactic, being of opinion that such a proceeding would be immoral, nay, even punishable. It is exclusively as a curative method that syphilization ought to be used, and even then only in cases where constitutional syphilis is sufficiently developed to leave no doubt of its existence; but then it ought to be commenced at once. I have often been asked whether it would not be advisable to begin even when the primary sore was there, and was such as to show with certainty that constitutional syphilis was about to follow. To this I answer that there are many cases in which we dare not take upon ourselves to decide that constitutional syphilis will manifest itself, and that conse-

quently it is our duty to wait until we are convinced that the dyscrasia is there.

My treatment of the primary sores is very simple. I cover them with lint dipped in sulphate of zinc solution (two grains to the ounce of water), and now and then I touch them with nitrate of silver, just as I would treat common ulcers. To use mercury is of course quite out of the question, and as a general rule I do not undertake to treat persons by syphilization who have been treated with mercury for their primary ulcers.

To commence syphilization, I take some matter from a primary syphilitic ulcer, usually from an indurated chancre, or else I take it from an artificial ulcer on some one who is being treated by syphilization, and on whom the ulcers result from an indurated chancre. I inoculate this matter on both sides of the chest in a similar manner to that in which vaccine matter is inoculated, being, however, more careful to bring it into the skin, because it does not take with such facility as does vaccine matter. I apply three inoculations on each side; not that I would not have the same result from one inoculation alone, but it sometimes happens that single inoculations do not take, and therefore I generally make three. However, if it is decided to avoid having too many cicatrices, one inoculation may be made at a time at first, and afterwards more, when the pustules and ulcers have become smaller, and when also the matter will take with less facility by reason of its being a later period of the treatment.

After three days I inoculate again, taking the matter from the pustules that were developed from the first inoculation, and being careful to apply the second inoculation at a good distance from the first one, in order to avoid the possibility of the ulcers running into one another, and thus causing large cicatrices. This precaution ought to be observed for the six or seven earlier inoculations.

At the end of three days I make the third inoculation with matter from the second one; and so I continue inoculating every third day, always using matter from the last pustules until it will take no more. Then I employ fresh matter, generally from another person who is being treated by syphilization, and now continue with this matter to inoculate both sides in the same way as with the first. This second matter will bring forth smaller pustules and ulcers than the first, and the series of inoculations will also be shorter. When this matter also refuses to take any longer, I use a third one, and go on in the same way, still inoculating at the sides. This third matter will produce but very little effect at the sides, and only take for a short series of inoculations. When it takes no longer at all, I begin with a new matter to inoculate on the upper arms,

where the pustules and ulcers will not be very small ; and at the same time I go on inoculating at the sides of the chest, where the effect will be quite indifferent. It will not be possible, however, to make so long a series of inoculations in the arms as were made at the sides. When the first matter that was inoculated at the upper arms will take no longer, the inoculations must be continued at this place with a new matter, in the same way as I have described for the inoculations at the sides; and when the same result is attained on the arms as at the sides, I go to the thighs and proceed there just as in the other places. Most frequently it will still be possible to get some well-developed pustules and ulcers in this last place, but it will not be long ere a negative result is obtained, and new matter required. As general immunity is approached, it will be found that every fresh matter will take for a shorter series of inoculations than the last. At length it will perhaps just take once or twice. On the thighs it will generally be possible to inoculate several times with fresh matter, and with such a result. When no matter whatever will take any longer on the thighs, general immunity has supervened, and even if it should prove possible to get a positive result from inoculation in some place or other after this time, it is of no practical significance.

Before concluding my description of the way in which I make the inoculations, I must insist on the absolute necessity of the treatment being carried through with scrupulous regularity. Inoculations must be made every third day, and in case they do not take, a new matter must be tried. The treatment is easy enough, but if the strictest regularity is not observed, and if one does not carry it through until immunity is obtained, the treatment ought not to be called syphilization. I cannot insist too strongly upon this point, because some people have commenced syphilization in order to cure syphilis, but have discontinued it after having made a certain number of inoculations, and have afterwards complained of their syphilization being a failure.

These continued inoculations will have occupied a period of three, three and a half, or four months. The time will occasionally vary, partly owing to the difference of intensity in the virus, partly to the individuality of the patient. Virus taken from the simple chancre or from the suppurating bubo has the greatest intensity. It may be inoculated through a longer series, and the time occupied by the treatment will be longer. It has occurred to me several times when I was using that kind of virus, that the phenomena continued unchanged for weeks, but this still remains to be more closely investigated.

The artificial ulcers that will come forth in consequence of

the inoculations must be dressed morning and night with cerate, or else during the day with linen dipped in water; or if there is any smell from the ulcers, in chlorine water. The patient can be out of bed during the whole course of treatment, and may move about in the open air as much as he likes, temperature making no difference—that is to say, he can stand 17° (Fahr.) below zero, and 86° of heat in the shade without any inconvenience to his ulcers; whether he might be able to stand a still higher degree of cold or heat without its doing any harm has not yet come within my experience.

With respect to the diet, I let the patients in the hospital have full allowance, and in my private practice I let them eat whatever they choose. As to their drink, I make some restriction: of wine I only let them have a mild claret in small quantity, and of the stronger liquors and of ale they are likewise allowed but a small quantity. Tobacco, for smoking or chewing, is not allowed during the syphilization, and for some time afterwards, because the irritation of the mucous membrane that it occasions will call forth and maintain ulcers.

It sometimes will happen during this treatment that mucous tubercles of the anus, &c., do not vanish very quickly. I then have to touch them with nitrate of silver, and the nearer the case approaches completion the more speedily will these phenomena disappear. It will not unfrequently happen that a new exanthematous eruption will take place during the syphilization; but this is of no consequence. You go on inoculating quietly as before, and so you do also even if iritis occurs, the only thing that is requisite besides the inoculation being to drop a solution of atropia into the eye; leeches, cold-water cataplasms, &c., are quite superfluous. I never even till lately used to drop in atropia, but in one case I had such excessive exudation in one pupil that the sight suffered from it. Even now exudations sometimes occur, but they are so insignificant that they can only be seen with a magnifying glass, and do not at all hurt the sight.

Often during syphilization swelling of different articulations will take place, especially of the wrist and of the ankle, and often of more of these articulations at a time. These articulatory swellings are not accompanied by much fever, and never by any heart-complaint. Another phenomenon observed during syphilization is an erythema which is very like erythema nodosum, only each surface is of a less regular shape than those of erythema nodosum, and the hue is more of a purple-red. This erythema will be found mostly round the wrist, on the forearms, on the forehead, and on the neck. It generally lasts for one or two weeks.

After syphilization there will often be eruptions of tubercula

mucosa on the genital organs or anus, or slight ulcerations upon the mucous membrane of the mouth or throat. These will generally disappear if left alone, or else they may be made to do so by being touched with nitrate of silver, and are very seldom of long duration.

I now come to a point which is of considerable practical importance—viz., the general health of the patient during and after syphilization. At the commencement of the treatment it must be readily understood that many patients will be in a very bad state; they are weak, anæmic, suffering from headache and sleeplessness. These phenomena disappear by degrees during the progress of the syphilization, and at the end of the treatment it will always be found that the patient is doing very well; and sometimes in my private practice my patients have even declared that they felt better than they did before they contracted the syphilis. This state of good health will continue also after the treatment, even if the patient should be exposed to cold, damp, and all sorts of fatigue.

Now the question is, how large the number of relapses will be in proportion to the number of individuals treated by syphilization, and I will state the numbers that are at my disposal. In my section of the hospital at Christiania there have been treated during the period from the month of October, 1852, till the end of July, 1865, 441 individuals suffering from constitutional syphilis. In my private practice I have treated at least 250, but these I am not going to mention, because they have not been under the control of other physicians. Out of the said 441 patients, 47 have returned to the hospital with a relapse, which makes little more than 10½ per cent.; but as very likely there will be some relapses amongst those that have been treated during these last years, I will suppose the number to rise up to 12 or 13 per cent. But then we have to inquire—What is generally understood by a relapse? I have already observed that many of the patients, towards the end of the treatment or soon afterwards, would get excoriations in the throat or single tubercula mucosa of the genital organs, which symptoms, however, will very soon disappear when touched with nitrate of silver. If these symptoms happen to arise after the patient has left the hospital, he will come back on account of them, and the said phenomena are then set down as relapses. The majority of the above-mentioned 47 cases of relapse belong to this class, and consequently have taken very little time for treatment. Others, however, have been real relapses, and have had to undergo a repetition of the former treatment. Thus 14 patients have undergone syphilization a second time, and 3 have been treated by iodide of potassium. Those who have been treated by iodide of potassium have suf-

fered from tertiary symptoms, especially orchitis, which I have seen two or three times after syphilization, and insignificant exostoses. With those that have been syphilized a second time, it has been observed that the ulcers will never become so large nor so deep as those of the first syphilization, and that it is impossible to carry the matter through so long a series of inoculations as at the first time—that is to say, *the organism never returns to the same point with respect to the reaction against the syphilitic virus as it exhibited before syphilization.*

However, as I have said before, I do not consider the relapses to be the chief point. I should not have so many objections to the mercurial treatment as compared with syphilization, if it were only the relapses that were to be taken into consideration ; but the general health of the patient during the treatment is of far greater importance. I have pointed out how the matter stands after the use of mercury, and I should think we have had time enough to form a well-grounded opinion upon that subject. As to syphilization, we have had only thirteen years of it, but this is a sufficiently long time to judge tolerably well of the question. When I take the patients that I have treated myself, I can only say that I meet several of these every day, and that they continue as well as possible ; but it is not, of course, to be expected that this method should be perfection, the less so as we are only yet at the commencement of its development. I will quote the cases that I know of which may be put in connexion with syphilization.

A man who was under treatment eight years ago is still complaining of constant headache and weakness. This man, however, has a large family, and is very badly off ; and for a long time after the treatment he used to live in a cold damp cellar. In Dr. Gjör's practice, in the course of the last few weeks, a middle-aged woman has had an attack of apoplexy while being syphilized, succeeded by hemiplegia ; but when I saw her a few days ago she had almost quite recovered, and syphilization was continued in the usual manner. This woman has been in very distressed circumstances of late, and has suffered a great deal from domestic troubles.

Of the above-mentioned 441 patients treated by syphilization, two women died whilst under treatment. One of these, Martha G., 50 years of age, entered the hospital on the 30th May, 1859, with secondary symptoms, a maculo-squamous exanthem, and angina. During the treatment she was attacked by diarrhœa, which changed into a dysenteric colic. She died on the 11th of August following. A post-mortem examination was made by Prosector E. Winge. Besides the changes in the colon caused by the dysentery, there was found amyloid degeneration of the spleen and kidneys, and partial granular atrophy of the kidneys,

which, according to Dr. Winge's suggestion, would probably be of an earliar date than the syphilis.

The other patient was Andrine J., aged 23 years and a half, who entered, pregnant, with secondary syphilis. During her confinement she was attacked by puerperal fever, and died. Dr. Winge states that at the post-mortem examination nothing syphilitic was found in the interior organs.

One of the patients treated by myself in the hospital died afterwards of heart-complaint (valvular affection)—namely, Marie N., aged 32 years. At the dissection made by Dr. Winge, besides the affection in the heart, there was found perihepatitis adhæsiva, cirrhosis ovariorum, and metritis chronica. Whether these changes were exclusively the consequences of the heart-complaint, or whether they owed their origin to syphilis, cannot be stated with certainty.

A patient suffering from phthisis, treated in my private practice for constitutional syphilis, died, a year and a half after treatment, from meningitis. At the post-mortem examination Dr. Winge found no syphilitic changes.

Another syphilitic patient died from pneumonia and meningitis, and another by poison ; but these not having been treated by myself, I shall say nothing further about them.

To pronounce in a few words my individual opinion upon syphilization, I would say that I never could have thought it possible to cure syphilis with such certainty as we find ourselves enabled to do by means of syphilization. Here I must, however, make the restriction, that it is necessary, in order to obtain this favourable result, that the patient should not have been formerly treated with mercury.

[In patients who have been previously treated with mercury, we have not the same certain development of phenomena when we employ syphilization, and we cannot look forward with certainty to a happy result of the treatment.]

It is interesting to find that long ago an experiment was made, not of regular syphilization, but of inoculation with fresh syphilitic matter, in order to cure an individual who had been treated in vain with mercury. This experiment was made by the French military surgeon, M. Percy. He examined, in the year 1777, two patients suffering from old-standing syphilitic disease that would not disappear even after a long and scrupulously executed course of treatment. Tired of the physic as well as of the strict diet, they went and exposed themselves to new infection, whereupon the old as well as the new disease disappeared by merely recommencing the same treatment that had hitherto been employed without success. From this he concluded that the new infection had so modified the organism as to make it anew sus-

ceptible to the ordinary curative means. The following year, upon being consulted by an individual suffering from constitutional syphilis that had defied all the different mercurial remedies, M. Percy resolved to try an artificial infection. He therefore made three inoculations on each arm, and allowed the syphilitic pustules to be gradually developed. Six weeks later, when the ulcers of the right arm were healed and those of the left nearly so, he commenced a mercurial treatment that completed the cure. It must be observed, however, that the formerly existing symptoms were not improved by the inoculations; on the contrary, the ulcers of the tonsils were still more extensive. Percy's experiment was not repeated by anyone else, but there were those who, without making any experiments for themselves, condemned his, and he was obliged to leave them alone for the future. Percy's own words concerning this affair were: "Ce n'est pas une découverte, c'est seulement un aperçu—c'est, si l'on veut, un délire de mon imagination."

Percy's observation had been long forgotten when syphilization appeared, and now it was not merely a single inoculation that was made, but a whole series, as before described. The new method was employed at random, as well with patients who had been formerly treated with mercury as with those who were being treated for the first time; and as to myself, I had no idea whatever when I began that a previous mercurial treatment could have any influence on the result. Accident here helped me to overcome some of the most formidable obstacles to the treatment by syphilization. I commenced by taking under treatment only two individuals, in one of whom the constitutional symptoms had recently appeared, whereas the other had undergone several mercurial treatments. While the first patient improved gradually and at last got rid of all syphilitic phenomena, the other was still covered with a syphilitic exanthem. From this and other cases that came under my observation, I soon saw that mercury had a decidedly important influence upon the result of syphilization. If this fact had not from the very first been so evident to me, I should certainly have chosen mercurialized individuals for my experiments, and the less perfect results that I should in this way have obtained would have given me quite a wrong idea of the whole subject of syphilization. Once having the influence of mercury so evidently shown, I had a rule for my guidance, and the relapses which occurred among patients who had formerly been treated with mercury could not shake my faith in syphilization.

Although it is sufficiently apparent that syphilization does not act in a similar manner with those who have been treated with mercury as with those who have undergone no treatment, yet the practical physician will want to know, if, notwith-

standing, syphilization is preferable to other modes of treatment, and he will also want to know whether, in case no other treatment should be possible, syphilization might still be of some use. I have not such rich material at my disposal for answering these questions as I had for showing the salutary influence of syphilization when no other treatment had been formerly tried. I have had but 72 patients in the hospital, and about 30 in my private practice; these latter cases, however, I shall not cite, since they have not been subjected to the control of other physicians. 22 persons out of the 72 have returned with relapses, or 30½ per cent.

This, however, does not make us much wiser. We require to know what the symptoms have been from which they were suffering. I shall classify them in the following manner:—

1. Early constitutional (secondary) cases, in which, after the mercurial treatment, affections of the skin and mucous membranes have appeared, like those against which the mercury was first employed. (In one case mercury had been used for the primary ulcer.) Among this class I reckon 28 individuals, of whom 8 have had a relapse, or 28⅔ per cent. Five of those have had slight relapses, but in the other three the relapse has been of a more advanced form; and the one that had been treated with mercury for the primary sore had had several relapses of a rather obstinate nature. It must be owned that this man had been given to drinking habits, which are known to make the syphilitic dyscrasia worse; but it is also not unlikely that the use of mercury at so early a period contributed to make the form so bad. It is my personal experience, and it is also proved by my before-mentioned statistical work, that the worst forms will most frequently be developed after the early use of mercury, especially when it has been employed in primary cases; and I will set it down as a rule that "the later, in the course of development of constitutional syphilis, mercury is given, the less destructive it will be to the organism." In most of the 20 cases syphilization has produced as certain an effect as in cases not treated before.

2. Late constitutional cases (tertiary forms) for which 42 individuals have been treated. Out of these 14 have had a relapse, or 32½ per cent.

These tertiary forms may, however, also be divided thus:—(*a*) The tuberculo-serpiginous syphilides, or the more or less excavated ulcers after suppurating gummata. These ulcers and syphilides are very slowly cured; the tuberculo-serpiginous syphilides will disappear by degrees, but sometimes not entirely. (*b*) There may be swelling of the bone or periosteum, accompanied by dolores osteocopi, and there may be caries. Swelling of the bone may be removed by syphilization, but only when it

is quite recent; and dolores osteocopi will not be much the better for it, whereas it will do more good to caries. Thus I have seen more than once carious parts of the palatum durum removed and the opening filled up again, in cases where syphilization was somewhat advanced when the removal took place. (c) The nervous symptoms developed in consequence of syphilis will not be removed by syphilization unless they have recently appeared, and even then not with any kind of certainty. In cases of mental alienation that have arisen in consequence of the syphilitic dyscrasia, syphilization has as yet never been tried, but there is reason to believe that it would do no more good here than in nervous affections generally.

In many of the tertiary and in some of the secondary cases I have given iodide of potassium in conjunction with syphilization, and it might perhaps be concluded that it was the iodide of potassium, and not the syphilization, which had produced the result. This is, however, not the case. The effect of syphilization is never more plainly seen than in cases of old-standing disease, where every means has been tried, until the organism has succumbed to mercury and iodine. Syphilization is tried, and it will often be seen how the local symptoms are influenced in different ways; but if there is little or no effect to be observed from the continued inoculations, and iodide of potassium is then tried, it will be found to act with its usual rapidity, whereas previously it was inoperative.

It is not, however, merely the effect syphilization has upon each symptom, but its effect upon the whole organism, which renders this treatment worthy of consideration. In this respect its power is most wonderful. The strength is returning, the weight is increasing, and the mental condition of the patient is being improved at the same time. This is not, however, an invariable rule; cases sometimes are met with in which we can do but little. Nevertheless, if we look upon the matter in general, I firmly maintain that, even for relapses after mercurial treatment, we can do no better than use syphilization. If hitherto I have not always followed this rule in my own practice, it has been because syphilization is still comparatively new, has been reluctantly received, and still awakens considerable resistance. If after syphilization there has been a relapse, nobody inquires if mercury had formerly been used; and as the relapses will always be much more frequent after mercurial treatment than in cases where no mercury has been employed, I have hitherto seldom used syphilization for mercurialized individuals.

With regard to the process of syphilization in persons who have been formerly treated with mercury, it requires to be noticed that there often will be no regular series of ulcers pro-

duced after the inoculations, especially in cases of old tertiary complications. It sometimes may be very difficult to make the inoculations take at all, and if they do take the effect will perhaps be but trifling and the series of inoculations short. It is also not certain that the first series of inoculations will be the longest; it often happens that the second, the third, or a following matter can be carried through more successive inoculations than the first. It will often happen that a few inoculations will be attended with a perfectly negative result; but after some weeks a new inoculation will take, and even with more effect than the first. It is evident that the organism is influenced by the first series of inoculations, short though it be. It will also happen that by giving some iodide of potassium between the application of the two matters the effect of the latter will be a great deal stronger. On the whole, the treatment of these old forms requires no small amount of patience and perseverance.

It will be found in some cases that, even with those who have used mercury, the inoculations run through their normal course, especially when the syphilitic phenomena are still limited to the secondary forms. In such cases there will sometimes be a considerable development of the ulcers.

There are persons who maintain that syphilization should not be resorted to until every other means had been tried in vain; until nose or palate was lost, and caries had destroyed different bones, especially those of the cranium; when phagedenic ulcers were spread over different parts of the body; when interior organs began to suffer, and a cachectic state announced the approaching end; then, and only then, they say, syphilization is indicated. When we think of the happy results that syphilization will give us in cases where no mercury has been formerly used, and when we also observe that those dreadful forms of syphilis often witnessed after mercurial treatment are hardly ever seen after syphilization, I do not see the reason why we should defer its adoption until we have, so to speak, artificially called forth those severe and almost hopeless forms. Why not commence by using the method by which we do not run the risk of evoking them at all?

These are, briefly, my views upon syphilization, such as I have observed and practised it. The observations are, however, not all my own, although I have not quoted other names. They are partly those of MM. Auzias-Turenne and Sperino, and partly those of men who have contributed to the practice of syphilization later than myself—viz., MM. Gjot and Bidenkap. It may readily be understood that in so wide a field, in which so few explorers are engaged, many things must have escaped observation. To do this work effectually would require the united efforts of a great many, and I think it would be well

worth while to examine the syphilitic as well as other animal viruses. This examination of the syphilitic virus ought, however, to be made exclusively by those who are convinced of the destructive effect of mercury in syphilitic diseases; and if the method of syphilization is adopted, it ought to be carried through according to what I have indicated here to the very minutest detail: not that I assert my method to be the best one in existence, but because I know with certainty that syphilization carried through in the way I have described leads to a successful result. If anyone has tried and has become convinced of this, than I shall be glad to hear that he is endeavouring to find a better way, which may very well be possible. — *Lancet, Sept.* 9, *and Oct.* 14, 1865, *pp.* 284, 425.

MIDWIFERY,

AND THE DISEASES OF WOMEN, ETC.

76.—ON THE FACILITATION OF THE FIRST STAGE OF LABOUR.

By Dr. Andrew Inglis.

[Many different means have been used for favouring the progress of the first stage of labour. Simple dilatation with the finger and the use of india-rubber dilators are the principal local means, whilst chloroform, antimony, bleeding, and emetics, have been employed with the intention of acting upon the uterus, through the general system.]

To show that there is good reason for believing that another means—namely, separation of the membranes for some distance round the os—will promote dilatation much more efficiently than any hitherto proposed, is the object of this paper ; and I believe that where attempts at direct dilatation have been successful, the success has been in great part owing to unintentional separation of the membranes. In pursuance of my object, I shall call attention to the effect on the character of labour of such a separation, either as occurring spontaneously or effected artificially for its induction or facilitation.

In the first stage of labour coming on and proceeding without interference, there are two opposite conditions of the passages,—one in which there is a copious discharge of viscid mucus, and which is often called a "wet labour ;" and another, in which there is hardly any, and labour is called "dry." At the full time, the first seems to occur normally in the cow, mare, bitch, &c., and, I am inclined to believe, is natural also in the human female. I consider the following as being the natural process in women :—The ovum having become ripe, the membranes separate from the cervical portion of the uterus, if not from the whole surface. They then by their weight press more heavily against the cervix, even when the patient is lying down ; and as the pressure is soft, equable, and continuous, the cervix gradually yields to it and becomes quite slack, and this takes place without the occurrence of pain. Next, when relaxation has become complete, the mucous discharge commences, proceeding from the uterus. Finally, a pain comes on and ter-

minates the first stage. That the discharge comes from the uterus is shown by its protruding from the os previous to its appearance in the vagina. Besides, it is only found when the membranes are already separated, and is very often tinged with blood before pains have been felt. A process resembling this form of the first stage may be seen where the other muscular canals are concerned, and perhaps most prominently in the case of the rectum. If the finger or bougie is gently and cautiously inserted past the sphincter ani, and kept there for some time, complete relaxation gradually ensues, a profuse discharge from within the sphincter comes on, and if the bougie is allowed to remain long enough, the muscular fibres above begin expulsive action.

The foregoing explanation seems equally applicable to "wet" cases of abortion or miscarrage in the human subject, except that in such cases healthy ripening of the ovum cannot be said to be the cause of the separation of the membranes.

Since I have begun to pay attention to the subject, I have met with many examples where the first stage has been sudden and short, on account of previous separation of the membranes. The following are details of three of these :—

In November last, I was sent for to attend a patient who had felt a subsidence of the uterine tumour, and a slight bearing down, affecting the bladder and rectum, but without pain. Examination showed the vagina to be in a normal condition, but the os was as large as a shilling and quite thin. The finger could be pushed a good way into the cervix, and the membranes were found separated as far as could be reached. There was no discharge. This condition of the parts continued for about sixty hours after I saw her first. When I called on her on the fourth morning, no pains had yet appeared ; but there was a quantity of thick mucus around the os, and, on pressing the abdomen, the membranes distinctly yielded and came down a little. Soon after my visit, two or three pains in close succession came on, and the child was born before any one could leave the house for assistance.

At the last meeting of the Society, I mentioned a case where, very shortly after labour had begun, and while the patient had as yet had very few pains, I found the os dilated and the membranes protruding beyond the external parts. Though she had not sent for any one, she had felt the pressing down for days before ; and as the membranes were displaced to the extent I have mentioned, a minute or two after the first pain had been felt, they must have been previously separated. It is worthy of notice that in this case there was great deformity of the pelvis.

About the beginning of October, I was called to a case where labour had not been expected by the patient for some weeks,

but where the membranes had ruptured in consequence of violent bodily exertion. I found the liquor amnii had only partially escaped from a tear in the membranes, and was still coming away every time she moved. There was a quantity of thick mucus around the os, which was slightly open, and moreover showed by its character that the ninth month was nearly if not quite complete. The pains came on in about twelve hours, and labour was over in less than quarter of an hour. In such cases, where the liquor amnii comes away before labour, I believe our fears as to the character of the labour should be at once allayed if we discover the thick mucous secretion, holding that its presence is always proof of previous separation of the membranes accompanied by a soft and dilatable state of the os.

The other form of the first stage, which I have designated "dry," is very different. Preliminary to labour there is no separation of the membranes, and consequently no slackening of the cervix, and there results a great increase in the amount of uterine exertion required, even where nothing worse is entailed ; for, though separation and dilatation generally at last take place, they do so only at the expense of multiplied and more distressing pains. At best, the pains may stop for a time after causing some separation, and labour on their return may thereby then come to take on the "wet" form ; but very often no such intermission occurs, and dilatation costs a long series of wearing-out pains. Moreover, the membranes may rupture, making dilatation have to be effected by the fœtus, and therefore even slower and more painful. Again sometimes the imperfectly dilated cervix is forced into the pelvis along with the head, and become jammed between the two, increasing greatly the pain and delay. Lastly, the resistance to dilatation may cause permanent cessation of the pains, or the cervix, or body of the uterus, or both, may rupture.

For some time when first in practice, I was in the habit of inducing premature labour in cases requiring such interference, either by introducing a catheter between the membranes and the uterus and leaving it there, or by using sponge tents. In these cases, labour often came on very soon, though a few resisted for a long time the action of both means combined, and the membranes had to be ruptured before pains could be made to come on regularly ; but in all cases, whether labour followed at once or came on only after great expenditure of time and trouble, the first stage was slow and painful, and in some the pains continued a few days before dilatation was complete.

About eighteen months ago, I attended a case where Dr. James Sidey brought on premature labour by the late Dr. Hamilton's method. By means of Dr. Hamilton's uterine bolt,

he separated the membranes some inches round the cervix, and the instrument was passed in and turned round every twelve hours. About forty-eight hours after the first separation of the membranes, the os was soft and dilatable, and a little discharge was apparent at the top of the vagina. Six hours later, I found the discharge copious; a few minutes after I had ascertained this by examination, labour came on suddenly; and in three or four pains the first stage was completed, and the head well down in the pelvis.

Soon after this I induced premature labour in the same manner in another case. In about forty-eight hours the discharge was copious, and the os soft and dilatable, but no pains had appeared; but immediately after my examination one pain came on and completed both stages.

Since the first of these cases I have never employed any other means for inducing premature labour, being convinced that it is the easiest for the patient, though not always the speediest. The first stage of labour induced by it seems identical in all respects with that of the "wet" form of labour occurring spontaneously.

The circumstance of the first stage of labour so induced, presenting so favourable a character, has led me to use that separation also for the facilitation of labour already begun in cases rendered tedious by so-called rigidity of the os. The number of cases in which I have had recourse to this mode of procedure is perhaps not yet sufficiently considerable to entitle me to lay much stress on these as bearing on my argument; but I may state that all of them which can be considered as affecting the question seem to support the practice I am advocating. The following are particulars of a few:—

On the evening of 5th November, I saw a patient in the fifth month of pregnancy, who had had strong pains all day; she thought the child was dead, and I could discover no fœtal sound. The os was firm, and barely admitted the finger, and there was no discharge. I ordered some opium, and called the next morning. The os was then nearly in the same state, but the pains were more severe. At night she was much worse, the opium having failed to stop the pains. The os was still firm and the discharge absent. I therefore separated the membranes from the cervix as far as I could reach, after which the pains ceased; and, after waiting for about two hours, I left her till morning. About ten hours afterwards I was sent for. She had not had any more pains, but felt something pressing down at the vulva. I examined and found that the entire ovum had slipped down into the vagina. The child had evidently been dead for some days.

On the 2nd of February, I was sent for to attend a woman at

the sixth month. There had been some strong pains; the abdomen was hard and contracted, and very tender to touch; and the os would not admit the finger. The pains continued for two days and two nights without producing any local change. As the fœtal sounds were normal I continued to give sedatives regularly during that time, but without any apparent effect on the pains. Vomiting then came on; the pulse rose to 130; and the tongue became brown and coated, like that of a patient with fever. I then tried to introduce my finger to separate the membranes; but found the os too firm to admit it, and therefore had recourse to a sound. The placenta being at the fundus, I separated the membranes all round to about the middle of the body of the uterus. The intervals between the pains then became longer, and a large bag of membranes gradually protruded, and in less than two hours the patient was delivered. The child was alive until immediately before birth, but never breathed.

On the 7th February, one of the New Town Dispensary pupils went to a patient in labour who was in the seventh month of pregnancy; and after she had been about fifty hours ill he sent for me. The os was only about the size of a shilling; and as there was no chance of labour going back, and moreover, the child seemed to be dead, I separated the membranes with the finger as far in as I could, with due regard to the position of the placenta, which was near the os, and had therefore to be avoided. After separation, the pains, though stronger, began to come on at longer intervals, and I believe would, in the absence of further interference, have died away; but, as I feared to risk longer delay, they were kept up by mechanical irritation of the uterus, and the child was extracted an hour and a half after my arrival. It was much decomposed.

On the 17th of May, I was called to see a patient in the eighth month. She had severe purging and vomiting. She suspected the child to be dead, and, as she was very dangerously ill, I considered it advisable to encourage the labour, which she thought threatening. I therefore separated the membranes with the finger as far as I could reach, and about ten hours after, a putrid fœtus was unexpectedly expelled by a single pain

In one of the cases I reported to the Society last month, I examined and found labour coming on at the full time while the membranes were still adherent. I separated them, and gave a large opiate. The pains ceased, but returned in about twelve hours, and though the pelvis was badly contracted, the first stage was got over with great ease.

To recapitulate—

1st, The easiest form of the first stage of labour is characterized by protrusion of the membranes and a copious discharge.

2nd, These are always direct consequences of separation of the membranes.

3rd, The result of artificial separation seems precisely similar to that of spontaneous.

The following is the practice I would recommend in regard to separation of the membranes :—1st, That it should always be the initial measure in the induction of premature labour ; and that until complete relaxation of the os has resulted from it, there should be no further interference of any other kind ; 2nd, That when labour has begun without previous separation of the membranes, and these are still adherent, they should always be at once separated, as the best means of overcoming the rigidity of the os, and the painful and prolonged first stage, which almost invariably accompany such a state of matters.

In the latter of these two cases, if the pains are severe and ineffective, I should be inclined to recommend sedatives to be given at the same time, in the hope of gaining time for painless relaxation to take place.

With regard to the means of separating the membranes, I have in most cases been able to do it with the finger, though in one or two an instrument was required. In one case, which I have not reported, I could not at first get the finger far enough in to effect any extensive separation ; but the small portion round the os, which was thus denuded, was so relaxed an hour after that I was able to insert the whole finger and separate to the desired extent.

Where I have used an instrument it has been Dr. Hamilton's uterine bolt, which I have already mentioned. From its rounded form at the end there is but little fear of rupturing the membranes with it.

Since reading the foregoing I have added the following as manifestly supporting my views :—

Dr. Trask, in his prize essay on Placenta Prævia, has shewn, on the one hand, that where the placenta is not much separated the os is almost always rigid, and that the force used to procure dilatation is the cause of death in a large proportion of the fatal cases of placenta prævia ; and, on the other hand, that those cases in which separation has taken place are specially characterized by speedy delivery by the natural efforts. He mentions also that the effect of artificial separation in such cases, as regards speedy expulsion, is nearly, though not quite, as good as that of natural separation.

Moreover, in all the cases I have met with myself I have found delivery take place naturally and easily where separation of the placenta had *previously taken place* to a great extent ;

while, after slight separation, extraction of the child had always to be effected by artificial means.

The usual history of primiparous cases seems also to be confirmatory of the views I have now advocated. The duration of the pregnancy being generally shorter, labour commences before the separation of the membranes has occurred, and the first stage is in consequence much slower than in subsequent labours. This is commonly supposed to be the result of the absence of that mucous discharge already referred to, but I think, in reality, chiefly arises from the want of previous separation of the membranes, of which the mucous discharge is only a symptom.—*Edinburgh Med. Journal, July* 1865, *p.* 24.

77.—THE ACTIVE CONSTITUENTS OF ERGOT.

Mr. Wenzell, a chemist, states that he has succeeded in isolating from ergot two vegetable nitrogenised alkaloids, which he terms respectively "ecbolina" and "ergotina." He calculates that half-a-grain of ecoblina produces the same effects as half-a-drachm of the ergot—judging from comparative experiments performed upon himself. It induces a specific action on the spinal column and muscular system, which leaves behind a great amount of debility. Ergotina seems to be less active than its congener, and induces some cerebral excitement. It has been used in several cases of uterine hemorrhage with satisfactory results, but from the distressing nausea and vomiting, with intense headache, it gave rise to, its employment had to be suspended.—*Med. Times and Gazette, Sept.* 2, 1865, *p.* 263.

78.—ON THE USE OF ERGOT IN CASES OF TEDIOUS LABOUR FROM INEFFICIENT ACTION OF THE UTERUS.

By Dr. D. Dyce Brown, M.A., Fellow of the Obstetrical Society of London.

The reason of ergot being inadmissible in so many of the cases of labour, is the exceedingly powerful effect which is apt to be produced by the ʒss. doses of the powder—excessive and often continuous pains coming on, even after a single dose. This result is, as is well known, most dangerous to the mother, unless the case be what one might call a typically normal case (barring the want of uterine action), and to the child, unless the labour be completed in about an hour and a half after. But if we could give the ergot in such a way as to avoid this excessive action, and produce pains, when they are absent or inefficient, closely imitating, or not to be distinguished from

natural pains in their strength and period of intermission, it is obvious that not only will it be much safer and better to use it thus in cases where there would be no risk with the usual doses, but its range of action will be much increased, so as to include cases where it is inadmissible in the usual mode of exhibition. Such an object can be obtained by the very simple plan of giving the ergot in doses of five or six grains of the powder. I mention the powder (which ought to be fresh ground), as I always use it in preference to the liquid preparations, on account of its certainty.

The idea of using these small doses first occurred to me from observing the frequent unmanageable action of the usual doses; and with the object of trying to get a mild action such as I have above described, I used gradually decreasing doses, till I came to about 5 grs. Ten grains seemed to produce, in the cases in which I used it, a safe, moderate, and natural amount of action; but as some constitutions are certainly more susceptible of the action of ergot than others, it is quite possible that even 10 grs. might in some other cases have produced more powerful action than I wished to bring on. I therefore thinks 5 grs. is the best dose to use, as it cannot have a violent action, and there is no good in using a smaller dose than this, as it is uncertain in its action, though I have succeeded with about $3\frac{1}{2}$ grs. Given in this manner, in the majority of cases, after a single dose, uterine action becomes increased in from five to twenty minutes, and the pains exactly resemble normal uterine pains in their strength, duration, and period of intermission; in fact, they are what might be called excellent, laudable pains, and no more. Sometimes the first dose seems inoperative, or at least not sufficient to bring the uterine action up to the required standard. In this case, after an interval of a quarter of an hour or twenty minutes to watch its effect, the dose may be repeated a second time. Rarely have I found that a third dose required to be given; while if no action is produced by the third dose I believe the constitution will be found to be unsusceptible of the action of ergot. I before remarked that different constitutions differ in their susceptibility to this drug, and I am satisfied that this sometimes goes to the extent of complete unsusceptibility. Dr. F. H. Ramsbotham suggests the possibility of this idiosyncrasy. After stating ("Obst. Med. and Surg.," p. 210) that its alleged inefficiency in certain cases may be owing to the powder not being fresh, he goes on to say:—"It may also be partly owing to the constitution of the patient not being susceptible of its peculiar action. We know that some persons are not susceptible of the peculiar action of mercury; and we may easily believe that in the same manner some constitutions may be unsusceptible

of the peculiar action of the ergot of rye." The plan of administering ergot in the small doses already mentioned I take the liberty of bringing before the profession, as it is recommended in no book I have seen, and from what I can learn from personal intercourse is next to unknown. Dr. D. D. Davies ("Operative Midwifery," p. 77), indeed, speaking of ergot, says that it is used in America in doses of a tablespoonful every ten minutes of an infusion of a scruple of the powder in an ounce and a half of water—that is, about seven grains of the powder to the dose. Dr. Simpson ("Obst. Works;" vol. i., p. 372) says, in reference to this remark of Davis's, which is founded on a statement in Prescott's work on Ergot, that "assuredly either the dose is accidentally understated, or it is in itself far too little to be of any avail." The substance of the last part of this sentence expresses the notion which is generally held by practitioners, namely, that ergot in smaller doses than a scruple in infusion, or corresponding quantities of the liquid preparations, are useless in labour, and that ʒss. is about the proper average dose. Dr. Simpson himself, however, in his memoir on "Anæsthesia in Labour," brings forward evidence of its power in inducing or quickening uterine action when received into the system in small quantity and in a more uncertain manner than when given by the mouth, namely, by inhalation. I may be allowed to quote the passage, as it is extremely interesting. After pointing out that labour pains continued as regularly under anæsthesia as before the inhalation was begun, Dr. Simpson goes on to say:—"Indeed, in some cases they have appeared to me to become increased as the consciousness of the patient became diminished. This has more particularly occurred with one or two patients who breathed ether combined with tincture of ergot, or containing a solution of its oil. A woman was brought into the Maternity Hospital on January 28, after being in labour for thirty or forty hours. It was her second child. Subsequently to her entering the hospital at 7 p.m. scarcely any decided uterine action could be said to take place. The os uteri was well opened, but the head was still high up in the pelvis, and when I saw her at 4 a.m. of the following morning—nine hours after her entrance into the hospital—little or no advance whatever had been made, and the case was becoming an anxious one. She was then made to inhale equal parts of sulphuric ether and tincture of ergot. In the course of a few minutes a series of extremely powerful uterine contractions supervened, and the child was born within a quarter of an hour of the commencement of inhalation. Dr. Simpson goes on to ask, "In this case was the re-excitement of strong pains the result of the action of the sulphuric ether,

or of the ergot, or of both? or was it a simple but very strange coincidence? More facts than I yet possess are necessary to decide such a question, but I have seen some cases which lead me to believe that other therapeutic agents besides those I have named may be readily introduced into the system by means of pulmonary inhalation." From this last sentence it is evident, I think, that Dr. Simpson inclines to answer his own question by attributing the increased action to the ergot. And from the cases in which I have used the ergot in small doses, and on the results of which I found this paper, I believe that this is the proper explanation of the sudden accession of pains. Its success, also, in doses of a few drops of the liquid preparations in checking excessive lochia and other discharges from the uterus gives evidence that it is capable of action on the uterus even in very small doses.—*Medical Times and Gazette, Nov.* 4, 1865, *p.* 492.

79.—ON THE INDUCTION OF PREMATURE LABOUR IN A CASE OF DEFORMED PELVIS.

Under the care of Dr. Graily Hewitt, at the British Lying-in Hospital.

[The patient was 28 years of age, and seven months advanced in pregnancy of her first child. Her shortness of stature and general appearance induced Dr. Hewitt to examine the pelvis per vaginam. The pelvis was found considerably contracted in its antero-posterior diameter; the conjugata was as nearly as possible three inches.]

After giving the case due consideration, Dr. Hewitt came to the conclusion to induce artificial premature labour at seven months and a half, and to attempt delivery at that period by the forceps or by turning, in order to give the patient a chance of bearing a live child.

On Jan. 20th, 1865, this project was carried into execution. The patient was now, however, about a week over the calculated seven months and a half. The head presented. At ten a.m. the os was gently dilated by means of the finger, and one of Dr. Barnes's india-rubber water-pressure dilators introduced. In an hour the os was enlarged to the size of the thumb. A No. 2 dilator was then introduced, and allowed to remain until three p.m., the dilatation being increased by injection of more fluid from time to time. At three p.m. it was withdrawn for a time. Pains had now set in periodically, at ten minutes interval; but they were feeble. The dilator was reintroduced, and the patient left again until eight p.m. At this time the pains were pretty strong, and tolerably regular. The membranes

were unruptured, the head presenting; but still quite above the brim. The head appeared well ossified. The more complete examination, now possible, confirmed the accuracy of the previous measurement of the pelvis.

The os being now well dilated, the membranes were ruptured at half-past eight p.m. After waiting for nearly an hour, it was found that the pains had no effect whatever in inducing descent of the head. Chloroform was accordingly administered, and the forceps introduced. One blade of Dr. Graily Hewitt's eight-inch straight forceps passed readily, but the second blade could not be applied. No better success attended the use of a pair of curved forceps; and finding the head very hard, larger than had been anticipated, and the pelvis appearing also a little contracted in its transverse diameter, Dr. Graily Hewitt decided to relinquish further efforts to apply the forceps, believing it impossible to drag the head through even after their application. The next alternative was turning. Without further delay this operation was performed at ten p.m., the left leg being first brought down. At this moment the child was alive. The second leg was secured, but very great resistance was encountered in bringing the breech through the pelvic brim; so much so, indeed, as to show that hopes of securing a live child were quite gone. By the time the breech had passed the pelvic brim the cord had ceased to pulsate. The arms were brought down one after the other by the blunt hook, and the shoulders extracted; but, as had been anticipated, there was not room for the head to pass the brim. It being manifestly better to empty the head than to further bruise the soft parts of the mother, the occipital bone was accordingly perforated, and the head (occiput looking directly backwards) extracted by the craniotomy forceps at half-past eleven p.m. Pressure was immediately made on the uterus by the matron, Mrs. Firth, and the placenta thrown off spontaneously in the course of less than five minutes. The uterus was well contracted. The next day the patient felt comfortable, and had slept well. The catheter was necessary to empty the bladder, and the labia were rather more swollen than usual; but she was free from pain. The diet ordered consisted of meat, eggs, and milk daily, and six ounces of brandy. Some slight disturbance attended the formation of the milk, which soon subsided, and the patient is now doing well.

The child was well formed, a female. Examination and measurement clearly showed that the patient must have been mistaken in her idea as to the date of the commencement of pregnancy; for the child measured seventeen inches and a half in length, was well developed, without any sign of immaturity. What offers, however, more conclusive proof of the age of the

fœtus is the condition of the lower epiphysis of the femur. Ossification of the lower femoral epiphysis only begins in the thirty-sixth or thirty-seventh week of gestation, and the size of the osseous nucleus is only about three lines in diameter when the fœtus reaches maturity. In the case of this fœtus the osseous nucleus measured over two lines in horizontal diameter, and there can be little doubt that the full term of gestation had only been anticipated in this instance by a week or two at most, instead of five or six weeks, as had been intended. It is unfortunate that the mistake occurred, though that mistake was almost inevitable, for it of course rendered futile the attempts to deliver the woman of a live child. If labour is induced on a future occasion in the manner which was intended at not later than seven months, the patient may probably have a living infant. With respect to the labour itself, it was completed in a little over twelve hours. The use of the india-rubber bag was of great service in dilating the os and rendering further manipulations easy, and, considering the difficulties of the case, the patient made an excellent recovery. This result is doubtless in great part due to the short time the soft parts were subjected to severe pressure.—*Lancet, June* 3, 1865, *p.* 593.

80.—ON ABORTION IN THE EARLY MONTHS OF PREGNANCY.

By Dr. Charles Bell.

It appears that it is impossible to guard against abortion in every instance, as for the most part the causes take effect suddenly and unexpectedly. Our object therefore should be more particularly directed to its treatment, so as to diminish as much as possible the effect on the constitution, and to place the patient in the most favourable position for regaining her health. These objects will be most satisfactorily attained by ascertaining early the true condition of the ovum, and assisting the womb to expel it without delay, if there is reason to believe that it is blighted, in place of vainly attempting to check the natural efforts of the womb to free itself of what has actually become a foreign body and a source of irritation and disease.

The symptoms which seem to indicate the death of the early fœtus are a blighted and shrunk condition of the papillæ of the breasts, and a relaxed and flabby state of the nipple, accompanied by a watery or rusty discharge, coming from the womb without pain or uterine effort, which are generally attended by extreme lassitude and exhaustion, amounting in some instances to faintings. In such cases, I should advise, even where there has been no flooding, the use of the ergot; and if it failed to promote the action of the uterus, then I should recommend the

introduction of sponge-tents, which will be sure to accomplish the object. Should flooding come on, which is almost certain to occur to a greater or less extent, it may be necessary to employ plugging along with the external application of cold. To these remedies may be added the internal use of large doses of the elixir of vitriol or the gallic acid. When uterine action is attended by severe pain, opiates or chloroform may be given with advantage. In order to restore the tone of the system after abortion, I have found chalybeates with port wine the most useful tonics.

In making these practical remarks, I am fully aware they contain nothing that it is new or original; but I am induced to urge their application in consequence of having observed the absurdity of attempting to prevent abortion taking place after it had become obvious that the fœtus was blighted; and I have known tedious bad health produced by the blighted ovum being retained in the womb.—*Edinburgh Medical Journal*, *Aug.* 1865, *p.* 132.

81.—CASE OF RUPTURE OF THE UTERUS; ABDOMINAL SECTION; SUBSEQUENT PREGNANCIES.

By Dr. Samuel S. Dyer, Ringwood.

[When first seen by Dr. Dyer rupture of the uterus had already occurred. The patient was quite sensible, the pulse quiet and fluttering, the breathing short and hurried, and the skin cold and clammy. The fœtus could be distinctly felt in the abdomen, the uterus being firmly contracted.]

Mr. Clifton told me he had been called this day at six o'clock in the morning, when he found the os uteri about the size of a shilling. The presentation was natural; the pains trifling and ineffectual. He waited two hours; and, as no progress was being made, he gave a dose of ergot, and continued in attendance another hour. But no increase of pains in force or frequency took place; and he left for his surgery and to see other patients, promising to return; and said that, if wanted before doing so, he was to be sent for. He heard no more of the case till the afternoon, and then drove down to Mockbeggar, taking his forceps with him. He was then told that no pains of any consequence had come on till the middle of the day, since which they had been steadily increasing in force and frequency. The os was now fully dilated, and the head at the brim of the pelvis. He went downstairs, determining to give more time for the natural termination of a case which now seemed to be going on favourably, leaving two female neighbours with the patient. In about an hour he was called hastily, and found the woman

fainting, blood issuing from the vagina; the head higher than it had been, and rapidly receding. The bystanders said that there had been a violent pain during which they heard a noise as if something had given way.

The result of our consultation was, that but one thing could be done to save the woman's life; and that it was our duty to give her this chance. I went back to the room to tell her our decision, to which she readily assented. Mr. Pridham of Broadway, my assistant at that time, drove back to my house, a distance of three miles, for instruments, chloroform, and appliances; and immediately on his return—four hours and a half from the rupture of the uterus—we performed the operation of gastrotomy for the removal of the child and placenta. The patient being well under the influence of chloroform, Mr. Clifton made an incision through the skin and cellular tissue, from an inch above the umbilicus to two inches above the symphysis pubis—the bladder having been previously emptied; he then divided the linea alba, and afterwards the peritoneum to the same extent, using the forefinger of the left hand as a director. The child and after-birth, with membranes and coagula, were quickly removed; and the uterus was seen to be well contracted. We exposed and handled the contents of the abdomen as little as possible, and brought the edges of the wound together, introducing silver-wire sutures through all the structures from the skin down to and including the peritoneum at short spaces. We applied long and broad straps of adhesive; dry lint, wadding, and a broad abdominal bandage.

When the patient recovered consciousness from the chloroform, she expressed herself as quite relieved, and feeling comfortable. We left a mixture of opium and brandy to be given at intervals during the night, and arranged to meet the next morning.

July 30th, 9.30 a.m. On entering the bedroom, we were as much astonished as gratified to see M. A. W. with a smiling, cheerful countenance, and to hear that she had passed a comfortable night, and felt as well as she had done after her former confinements. Such was her statement. The pulse was 110. She had no pain, and very little tenderness. Her urine passed freely, and there was some lochial discharge. We desired that the brandy should be continued in arrowroot, and the opium only given as occasion might require.

Aug. 1st. Mr. Rake met us. Matters were still favourable, though there had been some vomiting of fluid, which had a stercoraceous appearance; and, but for the absence of any concomitant symptom, we might have feared some impaction or gripping of intestine in the uterine rent.

Aug. 2nd. The patient was going on well; she had no further

vomiting. The dressings were removed, and the wound looked well. The strapping, lint, and bandage were reapplied.

I will not prolong the details of this case, which went on to recovery most favourably. The sutures were not removed for a week or ten days. The wound healed entirely by the first intention. The patient sat up in her room in three weeks, came down stairs, and went out of the house at the end of a month; from which time she resumed her household duties.

On September 9th following, Mr. Clifton fully reported this interesting and instructive case at a meeting of the South Hants Medico-Chirurgical Society; and in that month he sent the history of it, as embodied in his paper, to the Lancet. Its receipt was acknowledged in the "Notices to Correspondents." When a year had passed without its insertion in the pages of that journal, the editor was requested to curtail it as much as he liked, provided he would record the facts of the case. The non-compliance with this request has enabled me to publish it, with the interesting addenda of subsequent pregnancies, in the pages of the British Medical Journal.

1863. August 8th. As medical officer of the union in which Mary Ann Woods resides, I was summoned to attend her. She told me she had menstruated regularly from the previous November till May, but not since. She now had somewhat copious discharge, accompanied with intermitting and evidently uterine pain. Early on the morning of the 9th, she miscarried.

1864. June 11th. I again attended her in a miscarriage—on this occasion, with a four months' fœtus.

1865. June 6th. M. A. W. came under my care for some functional disorder, when I found, too, that she was more than seven, if not eight, months advanced in pregnancy; and that she had obtained an order for my attendance upon her during her labour.

July 23rd. At 2.30 a.m. I was called to her, and found that she had been three hours in labour. The os was dilated to about the size of a half-crown. The membranes were not ruptured. The head was presenting, but high up. The promontory of the sacrum advanced into the pelvic cavity rather more than one is accustomed to find it. By four o'clock the os uteri was fully dilated; and now the liquor amnii escaped, but the head was still above the pelvic brim. The expulsive pains were acquiring considerable force; and, as a precaution, I at once applied the long forceps to lessen the strain upon the uterine fibres by a little leverage coincident with the pains. I cannot say that I did more than just assist a natural delivery. At 6.30, a fine living male child was born. The placenta was expelled in a few minutes; and there has been nothing unusual to check a rapid convalescence.

In the Edinburgh Medical Journal of August 1864, a case of gastrotomy for rupture of the uterus is reported by Dr. Crighton; it is fully recorded in Braithwaite's *Retrospect*, vol. l. In the remarks, it is stated that "the statistics of Dr. Trask of New York give great encouragement in undertaking the apparently hopeless operation of gastrotomy in cases of rupture of the uterus; yet, since the date of the publication of these (1856), I cannot find any successful case recorded as having occurred in Great Britain."

It is a question of interest in the case of M. A. Woods, Had the administration of ergot anything to do with the rupture? From the length of time which elapsed after it was taken before the accident, we might say, Certainly not. It is hardly probable that a drug which generally produces its effect so promptly could have had its action so long delayed as to be in operation nine hours after its administration. If we want a cause, I think we have it in the combination of prominent promontory of sacrum and thin muscular fibre in an ill-fed, ill-nourished pauper, who eats animal food about once a year; the uterus falling somewhat forward on this account, and the axis of its outlet disadvantageously placed. Her rapid recovery after the operation is in great degree due to two things—the saving of any addition to the shock already existing by the administration of chloroform; and the use of metal sutures, producing as they do less irritation than those of other material; and our ability, therefore, of keeping them longer in the body. Operations of recent date—ovariotomy in particular—have proved how much more may be done within the abdomen by the surgeon than had been formerly supposed, without the risk of peritonitis; which fact, strengthened as it is by such cases as the above, should encourage us at once to act on the occurrence of like mishap, holding out, as we may do, to the patient and her friends, strong grounds for hope of recovery; and, with a view to extend still further this encouragement, I lose no time in making known the above facts.—*Brit. Med. Journal, Sept.* 9, 1865, *p.* 252.

82.—ON THE MANAGEMENT OF THE PLACENTA IN NATURAL LABOUR.

By Dr. James Paterson, Partick.

[The principal writers on obstetrics within the present century, may be classed somewhat loosely into two parties—namely, those who regard the expulsion of the placenta and membranes as of such importance, that they do not intermit their care over the womb until this process has been completed; and those who leave all to nature within certain limits of time, unless some emergency occur calling for more prompt assistance.]

The plan of maintaining the contraction of the uterus until the birth of the placenta, is not a mere theory, which has no value at the bed-side. The practice is very simple, being merely to keep up such an amount of stimulation of the uterus, as shall cause it to close around the placenta, so that the latter shall be ready to be acted upon by every succeeding contraction of the womb. The moderate pressure of the hand applied over the abdomen during the descent of the child, is nearly always sufficient at this stage. When the child is born, the hand must follow the descending womb, and grasp it, so gently as not to cause pain, and yet with a moderate firmness. This pressure ought scarcely to be relaxed during the separation of the child from the mother. In a majority of cases it will be found that this simple plan will have assisted the partial extrusion of the placenta through the os uteri, so that when the practitioner's hands are again free after tying the cord, he will find on introducing two fingers, that part of the after-birth is lying in the vagina. At this stage, to maintain still the pressure on the womb with the left hand, and straighten, without pulling, the cord with the right, by means of the two fingers in the vagina, will in most cases suffice to procure the expulsion of the placenta in about four to six minutes. I call it expulsion ; for it is not a withdrawal of the viscus, it is a true expulsion. When the placenta is thrown off in a short period, the womb is much less liable to relax than when it has been longer retained. I have been struck by the fact that where a child had been born some time, say twenty to thirty minutes before my arrival, the uterus can often be made to contract with great difficulty ; and I have found in such cases, that with all my care, I cannot stimulate the uterus to throw off its contents in anything like the same time that I could have done had I been present before the birth of the child, and this, be it observed, after the womb had had a considerable interval of rest for its natural functions. A series of propositions may cause these facts to stand out more satisfactorily :—

1. When the uterus continues its contractions after the birth of the child, so as to throw off the placenta in a short period, the chance of hemorrhage is very slight.

2. When unassisted, the womb generally discontinues its efforts, for a time, after the birth of the child, and during this rest the placenta cannot be expelled.

3. Hemorrhage occurs during complete or partial separation of the placenta, and while that viscus is still within the uterus ; and when it does supervene, it is generally in proportion to the non-contraction of the womb, and to the time during which the placenta remains unexpelled.

4. To assist the uterus to maintain its contractions for a short time after the birth of the child, to procure the separation and

expulsion of the placenta, is a rational method of diminishing the risk of hemorrhage, while, at the same time, it is the surest way to secure the permanent contraction of the uterus, and thereby conduce to a speedy recovery.

5. The method recommended above is almost painless, is safe, and in very many instances is quite successful.

In 305 cases of labour, consecutive in this sense, that they include all natural cases where I was present before the birth of the child, and where the plan named was adopted, I noted accurately the time elapsing between the birth of the child and of the placenta, and here state the results :—

In	1	case	the placenta came	with the child.	
"	1	"	" "	at the end of 1	minute.
"	34	cases	" "	" 2	minutes.
"	83	"	" "	" 3	"
"	63	"	" "	" 4	"
"	66	"	" "	" 5	"

The per centages were :—

In 2 minutes, ...	11·1
" 3 "	27·2
" 4 "	20·6
" 5 "	21·6

Of the 57 cases which exceeded 5 minutes, the time varied from 6 minutes to 40, but even including these, the average time from the birth of the child till the expulsion of the placenta, was only 4·89 minutes. In giving these tabular notes of time, I would merely remind you that they are the results of a certain mode of practice, and not the first object to be sought in any plan of managing the placenta. The only case where hemorrhage occurred was in one where the placenta had been rapidly expelled, and where a portion of the membranes had remained behind.

I need hardly mention that in speaking of the placenta I include the membranes; nor is it necessary to do more than allude to the extreme importance of making sure that *every* portion of the whole is thrown off.—*Glasgow Medical Journal, July* 1865, *p.* 129.

83.—ON ELECTRO-MAGNETISM IN POST-PARTUM. HEMORRHAGE.

By Daniel Walter Parsons, Esq., Liverpool.

[The patient was 27 years of age. She was delivered of twins, the labour was natural, but it was necessary to remove the

placenta by the hand owing to adhesion. This was preceded and followed by a good deal of flooding. A binder was firmly applied, and cold to the vulva, but still hemorrhage continued.]

Notwithstanding all his efforts to arrest the hemorrhage, Mr. Burrows saw that the patient was sinking rapidly. He tried ergot without producing any uterine contraction. He then removed the binder and grasped the uterus, directing the attendants to administer brandy freely. He tried the cold douche; but still the hemorrhage continued. He then made pressure upon the abdominal aorta, and for the first time he observed a beneficial result; the flooding was arrested. He kept up the pressure for an hour. I then arrived (at half-past three o'clock,) and was shocked at the sight which met my gaze on entering the room. The patient, anæmic, cold, almost pulseless, was lying in a pool of blood. There was only a slight draining from the uterine sinuses. I felt the uterus through the abdominal walls; it was large, flabby, and felt empty. I passed one hand into the cavity and removed a few small clots, at the same time keeping up pressure with the other hand. Finding that neither pressure nor the irritation of the hand in the uterus excited any muscular contraction, it occurred to me that electro-magnetism was our *dernier ressort*. I relieved Mr. Burrows in keeping up the pressure on the abdominal aorta, and directed him to drive to my house for my electro-magnetic apparatus. He arrived in a few minutes, and I proceeded without delay to apply one pole inside the uterus, while the other was being applied externally over the abdominal walls. The lowest power was first used, and then gradually increased to a medium. In a few minutes I felt slight contractions, and after continuing the current for half an hour I was enabled to grasp the whole of the uterus in my hand. I retained it in this manner for better than half an hour, and then applied a tight binder and pad. After clearing away as much of the *débris* as possible, Mrs. B. became quite conscious, and complained of being cold. I gave some brandy and hot water, and, fearing to continue hot drinks, I put extra clothing over her and directed a female to lie beside her. When she became warm she fell into a doze. I left her for a short time now, five o'clock.

At six o'clock very sick; skin warm; pulse 140; complained of binder being very tight. Ordered chloric ether and spt. ammon. co. every half hour; the binder to remain. No flooding.

Half-past nine. Improving in every respect. Ordered the mixture every hour; cold beef-water for drink.

Mrs. B. continued to improve daily, and was afterwards

enabled to nurse both children. She is now, August 16, 1865, as florid and healthy-looking as ever.

In this case the patient owed her life, in the first place, to the pressure which was maintained so persistently on the abdominal aorta, and most assuredly also to electro-magnetism. Had transfusion been used here the vital fluid would have permeated the system only to find an exit through the patent uterine sinuses. I have used the electro-magnetic fluid in one other similar case with the like beneficial result.—*Medical Times and Gazette, July* 26, 1865, *p.* 243.

84.—REMARKABLE CASE OF DEFORMITY.

By James Paget, Esq.

The following remarkable instance was related by Mr. Paget as he went round the wards, as having taken place under his own observation:—A person when pregnant with her first child chanced to shake hands with a man, who by an accident some years previously, had lost the middle fingers of the right hand, the index and little fingers, from long practice in grasping objects, having afterwards fallen almost into the shape of a lobster's claw. Being a nervous and very sensitive woman, she was startled and distressed when she became aware of the condition of the hand, and for several days she could not dismiss the recollection of it from her mind. When her child was born, it was found that the middle fingers of both hands, and the middle toes of both feet, were absent. After an interval of five years, during which she had had four perfectly formed children, and, being now pregnant with a fifth, she again encountered the man, and was again obliged to shake hands. She was so much disturbed by this occurrence, and so impressed with the idea that the child would be deformed, that in the evening she wrote down the event and her conviction regarding the child. When the child was born it was deformed exactly as the first had been.—*Medical Times and Gazette, Sept.* 23, 1865, *p.* 333.

85.—ON HYSTEROTOMY.

By T. Spencer Wells, Esq.

[This article is a comment on Dr. Marion Sims' mode of incising the os and cervix uteri. Mr. Spencer Wells considers that it requires careful consideration before we adopt it in this country. Mr. Spencer Wells then offers the following remarks on the subject.]

1. The *use of the speculum* is advocated by Dr. Sims because he never selects a plan of operating by the touch alone and in

the dark "if it be possible to aid the manipulatory process by the sight" And he asks, if any of us wanted to cut off part of a long uvula, "would it be judicious to run one finger down the throat and guide by it some machine for performing the operation in the dark? or would it be more surgical and more precise to look into the throat, seize the part with a proper appliance, and amputate it where our judgment would determine to be right and best?" There is something so captivating in this style of argument that we may be led to assent at once, and overlook the essentially different nature of the two cases. It would be impossible to feel the uvula with a finger, and guide an instrument for cutting part away, without exciting such convulsive spasms of the fauces as would mar the success of the operation. There is no such difficulty encountered in performing any operation on the uterus "by the touch alone and in the dark." Nor is there any sort of objection to looking down a woman's throat. But it makes an immense difference in the sufferings of a modest woman if an operation can be done under the bed-clothes without any exposure, or if the speculum has to be used, and held, as Dr. Sims directs, by an assistant, the patient "having been, perhaps, *eight or nine minutes* (!) on the table." But I would go further than this, and say to anyone who regards the fears of his patients little and their modesty still less, that the operation can be much better done with a proper instrument in a second or two by the touch alone that it can be by the complex process of speculum, assistant, hook, scissors, knife, and plugs, as advised by Dr. Sims, and I say this after trying both methods.

2. The *extent of incision* recommended by Dr. Sims is, in my opinion, too great, unnecessary, and the cause of the bleeding which leads to such precautions in his practice. The bleeding, he says, is "usually unimportant, but sometimes it is *furious.*" He divides the whole of the vaginal portion of the cervix quite through on both sides with scissors, and then with a knife carries on the scissor-cuts on each side "up to the very cavity of the womb." This is a far freer incision of the cervix than that recommended by Dr. Simpson, and even his incisions appear to me to be unnecessarily free. I have seen many women in whom, after such complete incision, the vaginal portion of the cervix has curled up and almost disappeared, while the remains of the cervical canal or the os internum have become nearly impervious.

Yet, putting aside the cases where we incise the cervix on account of fibroid tumours, I believe all the good that can be gained by hysterotomy in the cure of uterine flexions and of obstructive dysmenorrhœa and the sterility which is so often associated with these conditions, is certainly gained by an

incision which only passes through the mucous membrane and the innermost layer of muscular fibres. I believe it to be not only unnecessary, but dangerous and injurious, to cut into the thicker middle layer of muscular fibres—containing as it does large vessels, especially veins,—and *à fortiori* into the outer layer which is so intimately connected with the peritoneum. Indeed, I cannot see any possible object that can be attained by making a freer incision than is necessary to admit a No. 8 catheter easily into the uterine cavity and to imitate the transverse fissure into which the circular os of the virgin is converted in a woman who has borne a child. By the small incision chronic congestion of the mucous membrane and follicles of the cervix is relieved, and any existing stricture is divided as well as the circular fibres immediately beneath the mucous membrane called by Kölliker the *sphincter uteri;* while all important blood-vessels are avoided. I have incised the cervix very often, and I only remember one case in which there was any bleeding of consequence. In this patient I cut quite through the cervix as recommended by Dr. Sims, and plugged with cotton ; but there was a dangerous recurrence of bleeding when the plug came away forty-eight hours afterwards. I have never seen a peri-uterine abscess in my own practice, but I have seen two fatal cases after free incision in the practice of others ; and I have seen so many cases in which the cure of obstructive dysmenorrhœa, of obstinate flexions, and of sterility has followed the small incision, that I am confident very free incisions are as unnecessary as they are dangerous.—*Lancet, May* 27, 1865, *p.* 578.

86.—ON PUERPERAL FEVER.

By Dr. T. Snow Beck, F.R.S., London.

[There can be no doubt that one of the principal objects in the prevention of puerperal fever is to procure a complete and permanent contraction of the uterus after the birth of the child and the expulsion of the placenta. By many writers on the subject, this point is very slightly insisted upon.]

For some years past, I have carefully observed the state of the uterus immediately after childbirth, considered as a means of obviating that enlargement of the organ which too frequently follows childbirth or abortions, as well as preventing many of the ills to which parturient women are liable. And I am firmly convinced that many of the dangers and evils which women suffer after delivery may be prevented by procuring a complete and persistent contraction of the organ. It would appear that, when the vessels are at all pervious to the circulation of blood

within them, the presence of this fluid interferes with those changes which are necessary to reduce this organ to its condition previous to impregnation; and, to this end, I have been led by experience to administer the ergot of rye in all cases after the removal of the placenta, even if its employment was not indicated before this period of the labour. The combination I have found most useful has been that of the tincture of Indian hemp, powdered ergot of rye, and borax, mixed with some stimulant and aromatic. One to four doses of this mixture has been given at one or two hours' interval, according to circumstances, and with the best of results; for, although they occasion a considerable amount of after-pains, yet the comfort afterwards experienced, and the pleasing convalescence, more than compensate for the pains induced.

I believe it is generally considered that, when the uterus is so contracted as to prevent any further hemorrhage, this is sufficient to ensure the safety and well-being of the woman. But I have found that it is necessary to carry the contraction beyond this point before we can consider that we have ensured the safety, much less the well-doing, of the parturient women; and I have been led to think that this arises in many instances from a relaxation of the muscular tissue subsequent to the removal of the placenta, and after it has been fully contracted.

If these views be confirmed by the experience of others, the treatment of women immediately after delivery appears of much more importance than has been commonly supposed; and this extends to the diet, as well as to other matters. It would appear, by reason of a general belief that puerperal fever and other diseases of childbed women were purely inflammatory affections, which required to be treated by large bleedings and means calculated to prevent or reduce inflammation, that women during the puerperum were kept on a low and depressing diet. But these opinions are now generally considered to have been erroneous; and that, instead of keeping the female to a low and depressing diet, she requires a good diet and nourishing support, in order to relieve her from the physical fatigue and mental anxiety of the labour, to restore her health from the waste occasioned by the previous months of pregnancy, and to enable her to pass through those subsequent changes which have yet to take place. To this end, it would appear that a liberal diet is necessary, and, in some cases, even the addition of a stimulant. Of course, the regulation of these matters depends much upon the previous habits and state of health of the woman, as well as upon the season of the year and other incidental circumstances; but I am convinced there is not that danger in a liberal supporting diet which was at one time so generally believed, and that a stimulant similar to the "caudle" of old may frequently be

given with much advantage. This appears to be confirmed by the remark of Dr. Ferguson in his valuable essay. "The late matron of the hospital," he observes, "Mrs. Wright, remarked the effect of the hospital diet on the patients as often very depressing; and knowing, from the habits of this class of people, that gin was to many of them the common substitute for meat, she was induced to change the hospital dietary for a caudle in which gin was the staple. *We shortly after this had a marked diminution in the intensity of the epidemic.*"

The principles of treatment, which the review of these cases would suggest, would then appear to be: (1) to prevent the further injurious impregnation of the system, either by obstructing the further flow along the uterine sinuses, or by removing the noxious fluids from the interior of the uterus; (2) by supporting the system during the struggle in which it is engaged, and by meeting any accidental complication which may present itself; and (3) perhaps a further source of treatment is now afforded which may enable us to counteract, to some extent at least, the deleterious impregnation which has already taken place.

1. The metamorphosis or disintegration which takes place in the muscular tissue of the uterus after child-birth prior to its removal do not, it is said, commence before the fourth or sixth day; and, as the symptoms of injurious impregnation usually show themselves on the second or third day, it is not improbable that means might still be found to induce that further small amount of contraction in the organ which is necessary to close effectually the uterine sinuses. A continuous current of electricity, of low intensity, might have this effect. But I fear the other means already adverted to do not afford much chance of success; for it is undeniable that a truly efficient agent to induce the permanent contraction of the uterus is still a great desideratum.

The removal of the noxious fluids from the interior of the uterus appears to afford an important means of treatment, and to furnish one of the objects mentioned by Cruveilhier. "I am certain that diseases resulting from purulent infection would not be stamped with the seal of incurability, and that nature, seconded by art, would triumph in the majority of cases, if the pus, which is incessantly renewed, did not incessantly renew the sources of infection.'" But, in using these means, the remarks of Dr. Denham, though written so long ago, should be borne in remembrance: "I have seldom attempted to inject medicines of any kind into the vagina and uterus; though, from a consideration of the state of these parts, and of the fœtid humours discharged from them, it is reasonable to expect that emollient

or gentle detergent injections might be useful. However, if these are advised, there should be great caution both in the composing and administering of them."

On this subject, M. Piorry remarked, in the discussion on the treatment of puerperal fever before the Imperial Academy of Medicine at Paris in 1858: "It is indispensable to cleanse, by means of injections carefully employed, the uterine cavity from blood and putrid sanies which it contains. During five years I have not seen one female perish who has been attacked with puerperal peritonitis; and, in all women who have been confined, uterine injections have been carefully employed." (*Bullet. de l'Acad. Imperiale de Med.*, vol. xxiii, p. 461.) M. Hervez de Chégoin also observed: "The injections of the uterus, of which I have spoken, ought to be placed in the first rank (in the treatment); and, as I have said, their efficacy depends upon their proper use—that is to say, the care of the physician to seize the suitable moment. It ought to be directly upon the occurrence of the first indication, so slight and so important, and upon which I have fixed the attention."

The substances which offer the greatest probability of success are a weak solution of the sulphites or hyposulphites in tepid water. A long elastic tube may be passed to the fundus of the uterine cavity, and the interior of the organ carefully washed out with a weak solution of sulphite or hyposulphite of soda, by means of the ordinary enema apparatus: care being taken that no force be employed, and that all air be excluded from the apparatus prior to its introduction, by passing the fluid through it several times. The noxious fluids may thus, to a great extent, be removed; and, should any of the injected fluid gain entrance into the uterine sinuses, it will probably be more beneficial than injurious. This washing out of the uterine cavity may be repeated each day, or at shorter intervals, according to the circumstances of the particular case.

2. The means to support the system during the struggle, and to meet any accidental complication, are too well known to require any remarks.

3. As Cruveilhier observed, after detailing the various means employed to combat purulent infection, "all these means have failed as signally in my hands as in those of others." But, since that period, the researches of Dr. Polli of Milan, and of Dr. Mariano Semmola, upon the action of the sulphites, have rendered it probable that these agents may be found of much value in the treatment of injurious impregnation of the system, even after this has taken place. Both these observers concur in the opinion that these agents possess a remarkable power in putrid infections of the system, when they are not the result of specific

disease. They are given in divided doses, to the amount of from three to four drachms in the twenty-four hours; and the sulphites of magnesia or lime would appear to be the most suitable for internal administration. I have given lately these remedies in some cases, in doses of one scruple to one drachm every two or three hours, with encouraging results; but my experience of them is too limited to admit of any opinion.—*British Medical Journal*, *May* 13, 1865, *p.* 478.

87.—ON PUERPERAL FEVER.

By Dr. Robert Barnes, Fellow and Examiner in Midwifery, Royal College of Physicians, &c.

There is a condition of the blood, resulting partly from pregnancy and partly from puerpery, of which the chief feature is excess of fibrin. The blood when in this condition shows a remarkable tendency to coagulate in the vessels. The occurrence of what is called "phlegmasia dolens" is due to this condition. The febrile states associated with it I propose to call "Thrombotic puerperal fever." In their simple essence they are very distinct from the other leading types of child-bed fever; and frequently—perhaps more frequently than most other forms—the thrombotic variety occurs without any prominent complication: it therefore admits of clear definition. The foundation is undoubtedly laid during pregnancy. Perhaps it is, after all, only a sub-variety of the "excretory puerperal fever." Regarding the fibrin, after Mr. Simon, as an excrement, we must conclude that hyperinosis is the result of failure of the excretory apparatus. Now when there is excess of fibrin, there exists a proclivity to separation of it from the blood-stream. It is liable to be caught and deposited on any points where the general smoothness of the lining membrane of the vessels is broken: for example, on the valves of the heart. It is also subject to clot spontaneously wherever the blood-channel is unusually tortuous, where gravitation has to be overcome, where the vessels are exposed to compression, and the stream is consequently slow. Acute rheumatism—a disease which presents many instructive points of comparison with puerperal fever—is especially prone to precipitate fibrin upon the left cardiac valves. This is a form of *arterial thrombosis*. Probably the presence of a second morbid material is necessary to cause the fibrinous precipitation. The lactic acid of rheumatic blood may favour this process. In the great majority of puerperal cases the *thrombosis* is *venous*. And although clotting not seldom takes place apart from the obvious action of a second morbid material, in many cases it is highly probable that such

a cause comes into operation. For example: a woman may be going on smoothly up to ten or twelve days after labour, when some untoward accident suddenly disturbs the precarious calm—exposure to a draught, a severe mental shock or emotion, checks excretion, and a morbid material is thrown back into the blood. Within twelve hours of that accident pain is felt in the groin or calf, the pulse quickens, the skin is hot and dry, and the leg begins to swell. There is venous thrombosis. It is fortunate indeed that puerperal thrombosis is almost always venous, and so rarely arterial. The latter is, I believe, mostly fatal; the former generally ends in recovery. Why is it that arterial thrombosis is rare, and venous frequent? The explanation appears to me to be this:—A certain degree of retardation of the blood-stream offers the most favourable condition for that reaction which determines the precipitation of fibrin in the living vessels. Now the arterial blood not only moves more quickly, but it is not liable to local interruptions as is the blood in the veins; and it is also purer. Still the blood will sometimes coagulate in the arteries of the upper and lower extremities and of the brain. When it does so there is little time for the opening-up of collateral thoroughfares: the danger of gangrene or of paralysis and death is imminent.

More frequent than the thrombosis of arterial blood is thrombosis of the venous blood carried into the pulmonary arteries. As Virchow has shown, this is frequently capillary. It may even in some cases start from embolism—that is, from plugging of the pulmonic capillaries or smaller vessels by minute fragments of clot brought from a distance.

Whatsoever its origin, it is a very formidable affection. It explains a large proportion of the cases of sudden death that occur during the latter months of pregnancy, at the time of labour and in child-bed.

Less unfortunate is it when the obstruction takes place in the veins of the limbs. In this case no vital organ is concerned; there is generally time for secondary branches to dilate, and to compensate to a great extent for the incapacity of the trunks. The great majority of cases of phlegmasia dolens recover. The fact is, that although the blood is in a pathological condition, still the departure from health is not so great as it is in most other forms of puerperal fever. In the more fatal kinds—for instance, the septicæmic—one source of danger is the want of that very property, plasticity, which is here in excess. The empoisoned and degraded blood is carried to every tissue, every molecule of the body, producing fever and extensive phlegmasiæ of low type. The occurrence of thrombosis may therefore be regarded with satisfaction, as indicating a state of blood not apt

to produce the severer forms of peritonitis, metroperitonitis, or suppurative phlegmasiæ in the limbs.

The peculiar character of the swelling, the tenseness, the indisposition to pit, may be accounted for partly by the increased proportion of fibrin in the serum effused, coming as this does from hyperinotic blood, and by the suddenness of the effusion.

Such is the view of simple thrombotic puerperal fever or phlegmasia dolens which appears to me the most consistent with clinical observation. Loss of blood during labour greatly predisposes to this affection. It occurs frequently in pluriparæ. It is very apt to attack the same woman in successive labours—that is, it is prone to arise in those who have already venectasis of the lower extremities, or a marked disposition to this state.

A few words as to the issues and treatment. Of late years the danger of detachment of portions of the vein-clots, and of these being carried to the heart and pulmonary arteries, has been recognised. I have endeavoured elsewhere to collect what is known upon Puerperal Thrombosis and Embolia. Dr. Willoughby Wade has also added an interesting illustration of this subject. I do not think the danger of embolism is great in the pure class of cases of crural thrombosis. Still the risk is serious enough to serve as a caution against premature bodily exertion, or resort to friction of the affected limbs. Either may promote detachment of clot. But the risk of embolism increases when the thrombosis is complicated with marked blood-dyscrasia. Then there is a tendency to rapid disintegration of the clot, and fragments large enough to be arrested in the pulmonary capillaries may be carried to the heart. In the cases thus complicated, however, the toxæmic character so predominates that I prefer to consider them under the distinctive head of septicæmic puerperal fever.

The treatment may be discussed under the various heads: prophylactic, local, general, and restorative. The sketch I have given in previous lectures of the causes which promote adulteration of the blood in pregnancy and puerpery will serve to indicate what is to be done with the view of counteracting these causes. Local treatment is required in order to relieve the swelling and pain. The leg must be kept slightly raised on an inclined plane, and flexed inwards, so as to take off tension from the affected vessels. Leeching in the seat of the pain and swelling is commonly of great service, especially during the acute inflammatory stage. The limb should be wrapped up in cotton-wool surrounded with oil-silk. This promotes local and general diaphoresis. After the subsidence of inflammation,

blisters in the vicinity of the thrombosed veins are very useful. When absorption is resumed, flannel-rollers should replace the cotton-wool. The indication to give external support to the weakened vessels is obvious.

As more or less paralysis always attends, can anything be done to help the recovery of the power of motion? After the acute stage, frictions with oil or camphor liniment are useful; but the friction should be very gentle, and not prolonged. There may be danger of breaking up a clot, and so giving rise to embolism. Galvanism may be tried. It is unwise early to press the patient to get up and exert herself to walk; when the time for this arrives, it will mostly be well for her to wear elastic stockings. The general treatment that appears to me the most successful consists in the administration of salines with sedatives in the early or inflammatory stage; then bark or ammonia, and later, iron. Generous diet is called for. Chicken, game, mutton if the patient can take solid food, as she generally can after the first few days, should be prescribed. Wine, either port or good claret, is necessary. It is desirable here, as in all other forms of puerperal fever, to keep the circulating system well supplied with generous aliment. If this be done, the door is greatly closed against the entry of noxious matters.

Recovery is always tedious. The duration of phlegmasia dolens may extend to four or even to eight or ten weeks. To indulge in the hope of much accelerating recovery might, by suggesting active measures, lead to serious mischief. It is eminently a case for wise faith in the restorative work of Rest and Time. It is doubtful, indeed, whether veins which have undergone the distension and tortuosity consequent upon phlegmasia dolens ever perfectly regain their original soundness. Some degree of venectasis commonly persists. The parts so affected are liable at periods remote from the labour, indeed long after convalescence and presumed recovery, to become the seat of secondary thrombosis. In a minor degree the phenomena of phlegmasia dolens may be reproduced. Inflammation, sometimes erysipelatoid, springs up around the knotted and thrombosed veins. Febrile reaction ensues. And sometimes sloughing takes place over the seat of the obstructed vessel, and a deep, indolent ulcer is formed. A process strictly of necrosis has occurred as the consequence of arrested circulation and nutrition in the part. The predisposing cause of this secondary series of events is manifestly the loss of the physical integrity of the veins. But I believe an exciting cause is often supplied by the accidental complication of a degraded or adulterated condition of the blood favourable to coagulation.—*Lancet, Sept.* 30, 1865, *p.* 367.

88.—ON PUERPERAL TETANUS.

By Dr. George Hare Philipson, M.A., Physician to the Newcastle-upon-Tyne Dispensary and Fever Hospital, &c.

[At a varying time subsequent to the completion of the process of parturition, delirium, or even convulsions may occur, and occasionally tetanic symptoms. Spasm of the muscles of mastication is not unfrequent; but rigidity of the whole body is very uncommon. The following well-marked example, however, has occurred in the practice of a friend of the writer.]

On the 19th of February, 1865, Mrs. B., aged 39, was attended in her third confinement by Mr. Thompson. The presentation was natural, delivery being easily completed. The placenta was adherent, necessitating detachment, in the accomplishment of which a rather large amount of blood was lost. The advance towards convalescence was rapid; for on the eighth day she was able to leave her bed, and on the ninth to engage in her household duties. On the 1st of March, ten days after delivery, some difficulty was experienced in opening the mouth, and in turning the head from side to side. As she had been sitting near a window imperfect in obstructing the external air, the symptoms were attributed to the effect of cold, and were not regarded with much concern. The parts were well fomented, and a stimulant application applied.

By degrees the rigidity increased; and, on the morning of the 5th of March, the mouth became closed, and I was requested in consultation. The patient was in bed, on her left side, inclined to the prone position, with the head supported towards the chest by a pillow placed behind the occiput. When undisturbed, she was free from pain; but, on the least movement, felt oppression at the chest and difficulty in breathing. She had obtained sleep during the previous night. The surface of the body was cold, and bathed in perspiration. The pulse was 100, small, regular, and easily compressed. The jaws were immoveably fixed, the upper teeth slightly covering the lower. The temporal and masseter muscles were firmly contracted and hard. On being raised up, the head was forcibly drawn backwards, and instantly she complained of pain, and implored to be laid down again. The muscles attached to the sternum and scapulæ were rigid; those of the abdomen and extremities being perfectly flaccid. The fundus of the uterus was able to be felt just above the brim of the pelvis; but no pain was experienced on deep pressure. The lochial discharge was slight, and not offensive; the secretion of milk was small; the urine was natural, and had been voided without difficulty; the bowels had not been moved for two days. A pill of calomel and croton oil was introduced behind the molar teeth; and, two hours

later, an enema of turpentine and croton oil administered. Wine, beef-tea, and milk, at short intervals, were also ordered.

When visited the same evening, she was still lying on the left side, more prone, and with the thighs flexed on the abdomen. The pulse was 90, and quite regular. Since the forenoon, fully a pint of beef-tea and three glasses of wine had been swallowed. After the injection, the bowels acted freely, the urine being passed at the same time. The stools were very offensive; but did not contain any joints of tapeworm. During the afternoon, she was thrice severely convulsed; in the words of her husband, "jerked upon the bed." Deglutition was difficult, respiration impaired, and the lips slightly turgid. The jaws were unable to be moved or separated, even in the smallest degree. The muscles were more rigid, especially those of the back. The croton oil was repeated; and a blister applied to the nape of the neck.

About 12 p.m., she was again severely convulsed, and died very shortly afterwards. The friends would not allow an examination of the body.

The convulsive spasm and the tonic contraction were well marked. At first, the muscles of mastication were alone influenced; but during the last day of life, the muscular system generally became affected; rendered evident by the difficulty in respiration and deglutition.

The entire absence of symptoms directly connected with the nervous centres, render it highly probable that the irritation was eccentric in its source. Of such causes of idiopathic tetanus, irritation of the intestinal canal from tapeworm, is by far the most common. In this case, no such evidence was obtained. Hence, it may be supposed, that the nervous excitement was the result of uterine irritation, perhaps caused by a portion of the placenta having remained adherent to the uterine wall. Thus, a close resemblance to ordinary traumatic tetanus may be recognised.—*British Medical Journal, Sept.* 2, 1865, *p.* 232.

89.—CASE OF PUERPERAL CONVULSIONS SUCCESSFULLY TREATED BY THE INHALATION OF CHLOROFORM.

By Dr. Jas. Cuthill, Parochial Surgeon, Denny and Dunipace.

[The patient was a primipara, and aged 19 years. She had œdema of the feet and legs, and complained of great pain in the region of the vulva, the labia being hot, swollen, and painful to the touch.]

At 6 p.m. on the 9th, I got an urgent summons to attend my patient, which I immediately obeyed. In not more than five

minutes I was at her bedside, in time to witness the onset of a tremendous convulsive attack. When the spasms reached their height, which they did in about two minutes, the spectacle presented was truly frightful. There was complete fixation of the respiratory muscles, such as I once witnessed in a dog poisoned by strychnine; the face was literally black and hideously distorted; bloody foam issuing from the mouth; whilst so complete was the opisthotonos, that the body bent like a bow, rested on the heels and occiput, producing such curvature and tension of the distended abdomen as to threaten rupture of the uterus. I at once sent off for chloroform, but before the messenger arrived, which was in about ten minutes, a third attack, equally severe, came on,—the one I describe having been the second. I immediately put her under the influence of the chloroform, administered from a folded towel, and by periodical re-applications kept up the anæsthesia for three hours, all the while there being no return of the spasms. In the interim I had ascertained that there was no dilatation of the os, or other symptoms of labour. However, as the case seemed likely to prove a serious one, I desired a consultation with Dr. Hamilton of Falkirk, who arrived at 9 p.m. The inhalation was now stopped, and for three quarters of an hour there was no return of the convulsions, when a comparatively mild attack supervened. It was agreed to keep up the anæsthesia at intervals: at the same time, if any symptoms of labour occurred, or if the tendency to the recurrence of the attacks remained persistent, to puncture the membranes and hasten on the labour, as the only way of radically removing the primary cause of the ailment. I waited with my patient the whole night, mild convulsive attacks recurring at irregular intervals, which I as regularly combated by repeated exhibition of chloroform. At 10 a.m. on the 10th, indications of labour pains came on, and examination detected dilatation of the os uteri, to the size of a shilling. As the tendency to the convulsions still continued, I punctured the membranes with a silver catheter. The labour-pains gradually increased in frequency and intensity, until at 11.30 they had acquired a regular bearing-down character, and the patient began to complain of pain in the back. No more chloroform was given, and as the labour-pains increased in severity, the convulsions did not return. At 12 the first stage was completed, and at 12.30 p.m. as the patient seemed worn out and exhausted, I applied the forceps, and assisted the natural expulsive efforts, until at 1.10 p.m. she was delivered of a son. The placenta was expelled an hour afterwards. The patient remained in a dreamy confused state for three days, but her recovery was rapid, and unaccompanied by a single bad symptom. On the 20th, I found her in her room thoroughly convalescent, and with girlish pride trim-

ming a cap for her baby, in thorough oblivion of all her past troubles.

The baby, although rather small for a boy, is lively, and seems likely to do well. I may also remark that the patient's urine throughout was normal in quantity and specific gravity, and showed no trace of albumen. The propriety of giving a purgative was discussed, with the view of removing any intestinal irritation, but as the bowels had been regular before her illness, another dose of castor-oil was only given on the day after her delivery.

The prompt and decisive way in which the convulsive attacks were controlled by the chloroform, justly suggests the possible impropriety of, under any circumstances, resorting to bleeding, tartar emetic, opiates, and the other remedies recommended by the older writers. It at the same time shows the tolerance of anæsthetics under such circumstances, twelve ounces of chloroform having been expended in the case from first to last.

The propriety of the induction of labour is also an important question. As the fœtus, having only arrived at the eighth month, was most probably not viable, and as there were no symptoms of labour, interference would have been injudicious, but when labour did supervene, with the os in a dilatable condition, the course pursued seems to have been a proper one.—*Edinburgh Med. Journal, June* 1865, *p.* 1105.

90.—CASE OF PUERPERAL TETANUS. FOLLOWING ABORTION AND PLUGGING OF THE VAGINA.

By Joseph Blackshaw, Esq., Stockport.

[The patient was 48 years of age, and of a highly nervous temperament. It was necessary to plug the vagina, in consequence of profuse hemorrhage from threatened abortion. She rallied in the course of the following day, and recovered nicely.]

On the day following (Tuesday), just ten days from my first visit, I was unexpectedly requested to see her. She thought she had taken cold, and was then complaining of great stiffness of the deep-seated muscles of the neck and throat, with difficulty of swallowing, and was unable to open her mouth perfectly. As there was some febrile excitement, she was ordered to remain in bed, and to take a saline mixture with an aperient; to use hot fomentations; afterwards hot moist bran; to steam the fauces; and, if possible, to use a gargle.

On the two following days, Wednesday and Thursday, the painful tension of the masseters, as well as the muscles of the neck and throat, had so greatly increased as to prevent deglutition and bring on a state of perfect trismus. On Thursday

afternoon and evening, the tetanic seizures became increasingly frequent, producing great muscular rigidity, contortion of features, and slight opisthotonos. During the paroxysm, the pulse was small and feeble; but the consciousness was entire throughout. She continued in this state until Saturday evening, the tetanic spasms and opisthotonos gradually becoming more severe, when she died from exhaustion, five days from the first setting in of the tetanic symptoms.

Owing to the clenched state of the jaws, little was done in the way of treatment, beyond a little counter-irritation to the spine; the administering of a turpentine enema; and the removal of fæcal accumulations, which might prove a possible source of spinal irritation.

Puerperal tetanus is a very rare species of that disease in this climate; and this must be my apology for this communication. I have been in practice in this town for more than thirty years, the greater part of which I have been medical officer to a large district of a Poor-law union, including the union workhouse, and must have attended three or four thousands of women in labour at different periods of utero-gestation; and this is the first case that has occurred in my public or private practice, or, so far as I can learn, in that of the oldest obstetrician either here or in Manchester, with the exception of one case mentioned by Dr. Whitehead. Dr. Radford considers it a rare disease, but has known it to occur. Mr. Roberton, of the same city, also says that obstetric tetanus is a novelty to him, and that he has never seen it during a long and laborious practice. Nor is the disease one usually recognised in treatises on midwifery and the diseases of lying-in women. The extreme rarity and infrequency of this disease, notwithstanding the various lesions from the application of instruments, manual interference, turning, and other violence that the uterus must often sustain in protracted and difficult labours, points to a very different state of the nervous system from that which gives rise to traumatic tetanus in the various external injuries to which the body is subjected. Physiologists attribute this to the uterus receiving its nerves from the great sympathetic. It may be so. But of what that peculiarity of the nervous system consists in these cases, where the irritation from the uterus, as in the case of Mrs. H., is propagated to the cerebro-spinal system, is still shrouded in mystery. We can only say that, in the case of my patient, cold applied to the body, previously lowered by mental anxiety and loss of blood, may have given rise to a state of reflex spinal irritation, followed by tetanus; though probably, in ten thousand other instances, the same exciting causes would produce no such effects.

I regret that chloroform was not tried, as, besides the good effects it is said to have in convulsive diseases, it presents facilities of application where no internal remedy can be given.—*British Medical Journal, Sept.* 9, 1865, *p.* 252.

91.—ON DYSMENORRHŒA.

By Dr. Kidd.

(Abstract of a paper read before the Obstetrical Society of Dublin.)

Dr. Kidd read a paper on this subject, premising that painful menstruation was a symptom common to so many affections that to discuss the subject fully would be to enter on the consideration of the whole range of uterine and ovarian pathology. In fact dysmenorrhœa was not a disease *per se*, but a symptom, which might arise from one of several causes, and as such no more entitled to a place in our nosological list than (for instance) dropsy; but as dropsy was often the most prominent symptom, and one of which it is sometimes difficult to ascertain the cause, so dysmenorrhœa was very often the symptom which led the patient first to seek the aid of the physician, and on examination it was either found to arise from some organic derangement of which the sufferer was previously ignorant, or it may be impossible to detect any definite cause for its production. Cases of this last description are, however, becoming more rare, and there are good grounds for expecting that, as our knowledge of uterine diseases becomes more extended, we shall be able to trace all cases of painful menstruation to their cause, and by directing our treatment to the removal of this, make it more successful than it can claim to be at present.

I do not, then, mean to attempt a full exposition of the causes of dysmenorrhœa, but rather to relate briefly some of the more typical of the cases, of which I have records in my note-book, with such observations as they may suggest.

Case 1.—The first case I shall mention is that of a young English lady who came under my care in 1860, while on a visit with some relatives in Dublin. When I first visited her I found her in great pain: her face livid and dusky, her features contracted, surface of body cold, pulse small and quick. She lay writhing in bed, straining herself with ineffectual attempts to vomit, and every other minute dashing off the bedclothes and throwing herself from side to side in paroxysms of pain. In this state she continued several hours, notwithstanding the use of opiate enemata, hot fomentations, the exhibition of opiates and stimulants by the mouth, and ultimately the inhalation of chloroform; but this latter, I must say, I did not push

to its full physiological action, being deterred by the state of the circulation and the colour of the face. I learned from her at my visit the following day that she had been in the habit of suffering in this way at each menstrual period for some years past, though not generally to the same degree as on this occasion. When she first began to menstruate she felt no inordinate pain; but about three or four years after its commencement, and four or five before I saw her, she got a chill one day while menstruation was going on, by which it was suddenly suppressed. At the next menstrual period she felt some pain, and the discharge was so excessive that medical advice had to be obtained, and for a period of ten months after this she did not menstruate at all. After this period the function was reestablished, but its recurrence was ever afterwards attended with pain, although during the intervals she supposed herself to be in good health. By the use of warm hip baths, counter irritation over the iliac regions, leeching at the arms, tonics and aperients during the intervals, and the early use of opiates when the pain set in, the three or four succeeding catamenial periods passed without much suffering. She then returned to England, but her sufferings soon became as severe as ever.

I next saw this lady in November, 1862. She had then been married some months, and had come to reside in Dublin. The pain was now worse than before, her general health was suffering, and there was a good deal of mucopurulent discharge during the intervals, often of a brownish red colour, as if mixed with blood. She then suffered considerable pain at about the middle of the intervals between the periods, but without menstrual discharge. I now made a digital examination, when I found the uterus low in the pelvis, soft, large, and retroflexed. The os was so large as to admit the entrance of my fore-finger. On introducing a speculum I found the lips greatly congested and swollen, so as to evert the lining membrane of the cervix, and appearing to be so softened that the finger might be with ease pushed into their substance. From the interior of the cervix a long string of clear ropy mucus hung down into the vagina, and on attempting to remove this the surface was very easily made bleed. The uterine sound passed freely, and the retroverted fundus was easily replaced, but fell back again on the sound being withdrawn. Here, then, was a case of inflammation of the cervix extending into the canal of the neck; and the most prominent symptom—in fact almost the only one complained of—was pain during menstruation, and certainly the constitutional disturbance produced by that pain was greater than it has ever been my lot to see under any circumstances—the system being brought on many occasions into a state resembling the collapse of cholera.

By the use of frequent leeching to the cervix, counter irritation, painting the cervix with strong tincture of iodine, and long-continued rest, with appropriate constitutional treatment, the condition of the cervix was improved, and considerable relief from pain was given; but she still remained sterile, and after the lapse of some time all the symptoms returned, and I was again called to see her on 15th September, 1864, when I found her suffering nearly as much as on any previous occasion. As soon as the catamenial flow was over I examined the uterus, when I found the cervix again inflamed, and assuming the same spongy condition as before, which perhaps had never been entirely removed, and I determined, after subduing the acute symptoms, to try to modify the condition of the tissues by the deep action of the potassa cum calce. With this, after the lapse of a few days, I formed a deep eschar on each lip, and at the same time I passed the caustic into the interior of the neck, so as to act superficially on the mucous membrane lining it, when the eschars separated the ulcers produced by the caustic healed rapidly, but required the occasional application of nitrate of silver to check exuberant granulations. The cervix became firm and small, the secretion of tenacious mucus from the cavity of the neck ceased, and the os closed to its natural size. The succeeding period passed without any pain whatever: the lady became pregnant, and is now in her seventh month, and in the enjoyment of good health.

Case 2.—The next case is an illustration of that form of dysmenorrhœa in which the body of the uterus is the part engaged, the cervix often remaining healthy, or being but very slightly affected. Fortunately, this is not so common a form of the disease as that which existed in the preceding case, for, from the affected part not being so accessible to treatment, its cure is much more difficult. I have met the disease in two forms—1st, as an effect of deficient involution of the uterus after delivery; and 2nd, as the result of chronic internal metritis. The following case is an illustration of the first of these forms:—Mrs. W., a widow lady, consulted Dr. Banks for palpitation and a variety of dyspeptic symptoms, and on tracing these to their true source—a uterine affection—he placed her under my care. She was the mother of four children. Her husband had died of fever shortly before she was confined of her last child, now ten years old. She had a bad recovery from this labour, and was not able to nurse the child. Ever since that time she had suffered from pain in menstruation—the usual course being to have pain for some hours before the menstrual fluid appeared; the discharge then came on scantily, and afterwards gradually increased, when the pain subsided. She now remained free from pain, but on the third day the discharge generally increased

greatly in quantity, and on many occasions the hemorrhage was so great as seriously to alarm and weaken her. During the intervals of menstruation she suffered chiefly from palpitations and flatulent dyspepsia, but sometimes she had severe pains in the back, extending down one or other leg, and making her almost unable to move. This was attributed by a medical friend in the country to a falling backwards of the uterus, so as to press on some of the sacral nerves, and was relieved almost instantaneously by him by placing her in the erect posture, passing his finger into the vagina, and tilting the uterus forwards. On examination I found the cervix uteri a little larger than normal, but presenting its natural colour and consistency, with a smooth surface, and the os of its normal size. A sound was introduced and passed in to the extent of four inches, being an inch and a half more than it ought to do. On placing my hand on the hypogastric region I could detect the body of the uterus very much enlarged and tender to the touch, but the enlargement was uniform; there was no tumour in any part of the uterine walls, or localised swelling. This, with the history of the case, the absence of any unhealthy uterine discharge, and the comparative freedom from constitutional suffering, induced me to attribute the enlargement to deficient involution after labour rather than to chronic metritis. I may here remark that hemorrhage on the 2nd or 3rd day after menstruation is, I believe, an almost constant symptom in cases of enlargement of the body of the uterus. It will be observed that there was, in both of the foregoing cases, great pain before and at the commencement of menstruation, which was relieved when the discharge flowed freely; thus resembling cases where there was a mechanical impediment to the escape of the discharge, and yet during the intervals a sound passed freely into the uterus, showing that the canal was quite pervious. Two explanations of this fact have been offered. Dr. Graily Hewitt and Dr. Meadows believe that, though the canal is quite open during the intervals between successive menstruations, it is closed at the commencement of the process by the congestion and erectile enlargement of the uterus which takes place at this time, and that the pain arises from the efforts of the uterus to expel its contents. Scanzoni, adopting a similar view, suggests that "the abnormal nervous irritation of the uterus may give rise to reflex movements of the organ, and to a convulsive contraction of the cavity of the neck. Hence the escape of the blood which is already effused is impeded by an obstacle which irritates in its turn the motor nerves of the body and fundus of the uterus. This (he says) is what to us appears particularly to take place in cases where, after intense expulsive pains, lasting perhaps several hours, the patient suddenly ejects a considerable quan-

tity of blood, partly liquid and partly coagulated, and finds instantaneous relief." Dr. West, on the other hand, attributes the pain altogether to the congestion. "The congested womb aches (he says) until nature bleeds it, just as the head aches till the cupping glass or the leeches have relieved the overloaded cerebral vessels." My own observations incline me to conclude, with Dr. Graily Hewitt and Dr. Meadows, that in these cases there is partial, but temporary, menstrual retention, and to attribute this to the mechanical closure of the passage by the erected and congested state of its walls.

Acting on this hypothesis in the case now under consideration, I recommended the application of two or three leeches to the anus, that by emptying the hemorrhoidal veins which have a direct communication with those of the uterus, the pressure on these might be relieved. The effect was most beneficial. The pain at the commencement of the process has been greatly and almost immediately relieved, and there have been no hemorrhages, so that instead of being weakened by the leeching, there has been a great saving in the amount of blood lost, and in the strength of the patient. The administration of Indian hemp contributes to the same end, as it lessens the tendency to hemorrhage, and acts at the same time as a sedative. A combination of ipecacuanha with sedatives is also useful, the nausea caused by the ipecacuanha perhaps serving to relax the spasms, or reducing the erection of the os. In some of these cases the warm hip bath, especially after leeching and allowing the leech bites to bleed in the bath, gives more prompt relief than any other means.

The enlargement of the body of the uterus, or the chronic metritis, must be attended to during the inter-menstrual periods, but unfortunately both affections are very little amenable to treatment. In some cases of metritis the retention of the secretions within the uterus keeps up the irritation, so as to render all treatment useless, until the passage is fully dilated.

Dr. Simpson was I believe, the first eminent practitioner who adopted the plan of dividing the cervix, for doing which he uses a bistoire caché, furnished with a screw by which he can regulate the extent to which the blade protrudes from the shaft. This instrument he introduces in its closed state into the os, guiding it with his finger; he then presses on the handle, causing the blade to protrude; he then withdraws the instrument, dividing in doing so one side of the cervix. He then turns the instrument, reintroduces it, and divides the opposite side. He directs us in performing this operation to divide the os internum to a slight degree, and to slit completely the portion of the cervix within the vagina, so as to make a funnel-shaped opening. Nitrate of silver is then applied to the angles of the

wound so as to prevent union by the first intention, and the parts are to be painted over with a solution of perchloride of iron to prevent hemorrhage.

Our late president, Dr. Beatty, has suggested the use of the four-bladed speculum in this operation. In one case I adopted this plan, but found it very difficult to make sure of the distance to which I had introduced the metrotome into the uterus, owing to the way in which the polished surface reflected the light, so that in subsequent operations I have always used Sims' duck-billed speculum, which enables me to see and touch the os at the same time.

Various objections have been made to this operation both as to its details and to its principle. I shall first consider the improvements that have been suggested as to the details. In the first place, it is objected by Dr. Coghlan of Wexford (who has written some valuable papers on the subject) that the incision is unnecessarily large, and he has suggested the use of a cutting gorget with a probe point to make an opening of a definite size by being pushed into the uterus, the probe point keeping it within the canal; he then introduces a roll of lead to keep the wound from closing, and he has published several cases successfully treated on this plan. In using this instrument the finger is placed against the os uteri, and the gorget glided up on the finger until the point enters the os. It is then pushed on in the axis of dividing the cervix in its passage to the extent of its own breadth only. Dr. Coghlan believes the probe point is sufficient to keep the gorget within the canal of the cervix, and that from the limited extent of the incision there is little or no hemorrhage. He also states that this instrument may be used in cases where the os is too small to admit Simpson's instrument, as the probe point can pass into the smallest-sized os, and the blade makes an opening for itself. It is also claimed by Dr. Coghlan that the incision made by this instrument is quite large enough for all practical purposes, and that it does not require to be made so large as is done by Dr. Simpson's instrument, which, it is alleged, frequently creates hemorrhage to a serious extent. Having made the incision, Dr. Coghlan takes some fine thin lead and rolls it round the point of another instrument, which he calls a dilator. This instrument is furnished with a screw, by which it can be contracted or dilated, and the lead having been rolled round its point it is introduced in the closed state into the uterus, and then by pressing on the handle the instrument is expanded, and the lead opened out. This being done the instrument is closed and withdrawn; leaving the leaden tube in the canal of the cervix. In some cases, where the contraction is not very great, Dr. Coghlan proposes to dispense with the cutting part of the

operation altogether, as by introducing the dilator into the cavity of the os it may be dilated sufficiently, and by letting the lead remain within the opening for some time the dilatation may be rendered permanent. It believe this plan to be often very useful, especially after the use of sea tangle or other dilating tents.

Another instrument for performing this operation has been proposed by Dr. Greenhalgh of London. Unlike Dr. Coghlan's, this instrument has a blunt point, and in this I think has an advantage in point of safety. In some cases Dr. Greenhalgh's instrument would not in the first instance pass into the uterus, but this is easily remedied by in the first instance slightly dilating the os by the use of sponge or sea tangle. Dr. Greenhalgh's instrument is furnished with two blades, concealed in a metallic sheath. It is introduced in its closed state into the uterus, the handle is then withdrawn, which causes the blades to protrude, one at each side, slowly expanding in proportion as the instrument is withdrawn from the uterus. In this way both sides of the os are cut by one operation. It may be observed that the degree to which the blades protrude is, at first, very small; but as the handle is withdrawn the blades become gradually divaricated. Thus the os internum is divided very slightly, and the os externum completely, making the funnel-shaped incision recommended by Simpson, but doing it all at one operation. I believe this to be an improvement on Dr. Simpson's instrument, inasmuch as it divides the cervix at one operation, and divides the two sides equally. In using Simpson's instrument the back is firmly supported during the dividing of the first side of the cervix, but in dividing the opposite side the back of the metrotome slips into the incision already made, and the second side is either divided insufficiently, causing the operation to fail, or it may be divided too extensively, giving rise to profuse hemorrhage, or some of the other accidents that have followed the operation. But Dr. Greenhalgh's instrument seems to me objectionable, and that for two reasons—first, it attempts to do by mechanical arrangements what should be done by the hand and eye of the operator—viz., to regulate the extent and direction of the divisions, and it is consequently not adapted to uteri of varying size; second, the bulk of the sheath obstructs the view of the parts to be divided.

The instrument I have used in all my late operations is the one known as Dr. Savage's. It is like a scissors, and is composed of two blades with their cutting edges directed outwards. When the instrument is closed the blades overlap each other, and thus the cutting edge of each is protected by the back of the other, so that it can be introduced into the cavity of the

cervix without any additional protecting sheath, such as is used in Dr. Simpson's and Dr. Greenhalgh's instruments. It is introduced into the uterus within the os internum in the closed state, the canal being first dilated with sea-tangle if necessary. The blades are then opened by pressing on the handle, and then withdrawing the instrument you divide the cervix; the extent to which the blades are expanded being regulated by a screw. In using this instrument I have always placed the patient in the prone position, and introduced the duck-bill speculum, which is held of course by an assistant. I then pass the instrument into the uterus and place my finger on it close to the os. The advantage of this is, that you can both see and touch the os at the same time, and tell with accuracy the distance to which you pass the blade into the os, so as not to pass it farther than requisite. In withdrawing the instrument I expand the blades in the first instance very slowly, so as to make the incision in the os internum very narrow; and I divaricate the blades as I withdraw them, so as to divide as much of the cervix as I think necessary, which can be done with great accuracy, as the operation is under the guidance of both finger and eye. I am generally in the habit after the operation of introducing a roll of thin lead, as recommended by Dr. Coghlan; but Dr. Coghlan's instrument for introducing the lead seems to me to be too small, and I generally use an ordinary dressing forceps by rolling the lead round the forceps, and then passing it into the wound, when by opening the blades of the forceps I expand the lead, taking care to do so more below than above, so as to preserve the funnel-shape of the incision. I then withdraw the forceps, leaving the lead in the wound. I then place a piece of cotton wool in the upper part of the vagina, so as to keep the lead in its place, and to control bleeding, if there should be any. The lead may be withdrawn after a few hours, as there will be no risk of union by the first intention, but in some cases it may require to be reintroduced at a subsequent period to prevent contraction of the cicatrix.

In a paper recently published in the 'Lancet,' Dr. Marion Sims advocates very strongly the slitting of the os uteri in cases of dysmenorrhœa, and describes the mode he adopts, which is different from any of those I have alluded to. He places the patient in the prone position, and, having introduced the duck-bill speculum, he seizes the anterior lip of the uterus with a hook, so as to steady it and draw it downwards, and then he divides with a scissors the sub-vaginal portion completely through on each side. Having done this, he passes a knife, and divides the os internum on each side, but to a less degree, of course. The knife he uses in this stage of the operation consists of a long blunt stem, with a small, curved, and movable

blade attached at its point. I have not seen the operation performed in this manner; but, judging from the description, it does not seem to have any advantage over the less complicated method with Savage's hysterotome.

So much as to the various instruments which have been devised for performing this operation. The objections which have been made to the principle of the operation itself are founded—firstly, on the hemorrhage which it produces. As to this, I believe that with Dr. Savage or Dr. Greenhalgh's instruments the liability to hemorrhage is very much lessened, and, at all events, it can, I believe, in all cases be fully controlled by plugging the vagina. Another objection, and perhaps a more serious one, is founded on the liability to the setting in of pelvic cellulitis after the operation, or of inflammation extending to the peritoneum, and giving rise, either to acute peritonitis, or (as occurs more frequently) the subacute and chronic form of the disease. This objection is, no doubt, a very serious one; but I think that by selecting a proper time for the operation—*i.e.*, when the patient is in good health, and by insisting on a sufficient amount of rest after the operation, the danger is very much lessened. There is no doubt that in cases where this operation has been performed in the study of the surgeon, and the patient allowed to walk home and go about her ordinary avocations, this danger is very much increased. Dr. Gream of London has lately proposed a new objection to the operation, but he has surely exaggerated. He states that in a case in which the operation was performed and the patient subsequently proved pregnant, he found the os, at an early period of the pregnancy, completely open and the membrane exposed, as if in the first stage of labour. The result was, that though the lady proved pregnant on several occasions, she always aborted in the third or fourth month. I have attended a lady in several pregnancies who had been operated upon by Dr. Simpson, and there was no tendency to abort, nor was the os dilated to such an extent as to expose the membranes.—*Dublin Medical Press, June* 7, 1865, *p.* 536.

92.—ON THE DYSMENORRHŒA, METRORRHAGIA, OVARITIS AND STERILITY ASSOCIATED WITH A PECULIAR FORM OF THE CERVIX UTERI, AND THE TREATMENT BY DIVISION.

By Dr. Robert Barnes.

(Abstract of a paper read before the Obstetrical Society of London.)

The author described and figured the form of cervix uteri which projected into the vagina as a conical body, the vagina

appearing to be reflected off at a point nearer the os internum than normal. The os externum was usually minute, scarcely admitting the uterine sound. This (the os externum) was the real seat of constriction. The os internum normally was a narrow opening; and in these cases of dysmenorrhœa and sterility it was commonly found to be of normal calibre. It was therefore unnecessary to divide it. It was, moreover, dangerous to divide it, on account of the close proximity of the large vessels and plexuses running into the uterus on a level with it. The author maintained that this form of cervix was a cause also of retro- and peri-uterine hæmatocele, and of peritonitis. All these consequences might arise in single women. In the married state the evils enumerated were aggravated, and new ones arose. Women with this peculiarity were generally sterile; and if they became pregnant it was early in life, before the further consequences were developed. These were flexions, deviations, inflammation of the cervix and body, hypertrophy. Discussing the question of treatment, the author showed that dilatation was unsatisfactory; that incision of the os internum, as practised by Dr. Simpson's single bistourie cache and by Dr. Greenhalgh's double bistourie caché, was unsafe and superfluous. He objected to the latter instrument, especially, that it must cut as it was set—that it was too much of an automatic machine, not leaving scope for the judgment of the operator. His (Dr. Barnes's) own instrument, constructed like a pair of scissors, acted on the same principle as Dr. Sims's: it divided only the os externum, so as to open the cavity of the cervix; the part to be cut being first seized between the two blades, the operation was perfectly free from risk; the hemorrhage was usually slight; and a good os was made. He had performed the operation many times, both in hospital and private practice, and was well satisfied with the results. One advantage of incision over dilatation was, that it relieved the engorgement and inflammation.

In illustration of the behaviour of the conical cervix uteri under labour, two cases were narrated. In one, the cervix and os uteri had returned to their original state, although a fœtus of four-and-a-half or five months' development had been expelled through them. In the other case it was necessary to open the cervix artificially by means of the author's cervical dilator and incisions in order to deliver a full-grown child. In both cases pelvic cellulitis followed labour.

Mr. Baker Brown thanked Dr. Barnes for having brought the subject forward. He agreed with most of what had been stated in the paper; was opposed to dilatation as being inefficient and temporary. He described his mode of operating, which was to place the patient in the lithotomy position, and,

having introduced a bent speculum, he seized the os with a pair of forceps, and divided it with Simpson's hysterotome. He never divided the internal os; always used a plug of oiled lint to prevent hemorrhage. He regretted that the operation had lately been condemned by a high authority, but believed it was the only efficient and permanent remedy for these painful affections.

Dr. Greenhalgh was surprised to hear the President's opinion that the seat of stricture in these cases was mostly at the external os. He (Dr. Greenhalgh), on the contrary, expressed his conviction that in the great majority of cases the stricture is situate at the internal os, and consequently he recommended division of the internal as well as the external os. After division he usually introduced one of his bilateral expanding stems, which keeps up steady dilatation, and prevents contraction. As regarded hemorrhage, which some appeared so to dread, he had never but once met with it, though he had operated in nearly one hundred cases. He always used his own bilateral instrument, which cuts both sides at once. The advantages of his plan of operating were, he believed, extreme exactitude, facility, painlessness, and the avoidance of any personal exposure. He expressed his surprise at the remark of Mr. Brown that he never divided the internal os, when he (Dr. Greenhalgh) had seen him on several occasions freely incise the internal os in the cases under consideration.

Mr. Baker Brown, in answer to Dr. Greenhalgh, said that that gentleman must be mistaken in what he had seen at the London Surgical Home. He repeated that he never in cases of dysmenorrhœa cut through the internal os. Dr. Greenhalgh was evidently confounding this operation with that for fibrous tumour, retroversion, retroflexion, &c., of the uterus, in which he (Mr. Brown) incised freely, and generally through the internal os.

Dr. Routh fully confirmed Dr. Greenhalgh's view. For his own part, he believed in by far the majority of cases the obstruction was at the *inner* and not the *outer* os; although he did not deny that in some cases of conoid cervix it was present at the external os. He agreed with Dr. Gream in believing that Dr. Sims's plan of operation would occasionally leave a deformed cervix for life; and he did not think it was necessary to cut through the entire cervix. The instrument Dr. Greenhalgh had invented obviated all danger from hemorrhage. The same was true of his (Dr. Routh's) instrument, which he, however, preferred, because on the bend, and, therefore, more easy of application in *flexion* cases. A little bleeding was salutary. In most of these cases there was a complication of congestion, which the very incision by the subsequent hemorrhage relieved.

But there was no doubt that such incisions, however freely made, had a tendency to contract again. Hence it was necessary to keep the cut made patent by some internal uterine pessary, and for some time, it might be for months, so as to allow it to become properly lined with mucous membrane and incontractible. He knew several persons now walking about London with these. In other cases their removal had been followed by conjugal relations and pregnancy, though previously sterile for years. Of the use of sponge-tents and other modes of artificial dilatation in these cases he spoke disparagingly. He had seen cellular abscess and death follow their use. They should be used with the greatest caution. He also believed cases of dysmenorrhœa were more common than was generally supposed. Not only was the seat of obstruction more frequently at the *internal* os than the *external*, but, indeed, in many cases the external os was patent and abnormally so, as shown by Dr. Henry Bennet. And there were many, and by far more numerous, cases of dysmenorrhœa which were in no way due to stricture at either os. As these cases were not, however, referred to by Dr. Barnes, he did not allude to them further.

Dr. Graily Hewitt thought that the two questions of the treatment of dysmenorrhœa and of sterility by means of incision of the cervix uteri had been too much mixed up together. He would say a few words first respecting dysmenorrhœa. He believed that in bad cases of dysmenorrhœa the condition present was frequently retention of the fluid in the uterus, and that this retention caused the pain; and he had been at some trouble to prove this. But, on the other hand, he also thought that the condition was capable of being relieved, in most cases, without resort to mechanical treatment of the cervix uteri. The great thing was to diminish the flow of blood, and this could be regulated by general measures; but that there were a few cases in which such general measures were useless he admitted. He differed from the President in reference to the most common seat of the constriction; for although there were cases in which the os uteri was congenitally extremely small and narrow, yet in the larger number of cases of dysmenorrhœa the impediment was situated at the junction of the cervix with the body of the uterus. With regard to the best method of applying mechanical relief when such was required, he thought that cases must be treated on their own merits. Where the cervix uteri was hard and dense, the cutting operation was most indicated, the difficulty being here the greatest; but under other circumstances he preferred the use of tents as dilators. The sea-tangle tent was, he considered, a perfectly safe means of dilating the cervix uteri; but, he would repeat, the cases

were few requiring this treatment. As to the mode of incising the cervix or os uteri, here again the operation must be selected according the case : no one operation could be suited to all circumstances. He would next say a few words on the subject of sterility. It was undoubted that in certain cases the cure of sterility could be effected by dilating the cervix uteri, and much had been said as to the superiority of one mode of dilatation over another. The fact was, that so long as the canal of the cervix was a little enlarged, whether by incision or by dilatation, the necessary end would be served. The great object was to secure a tolerable patency of the canal at about the menstrual period, when conception was most likely to occur. Supposing the sterility to be cured, the dysmenorrhœa which might be associated with it would be also, in all probability, permanently relieved.—*Lancet, July* 15, 1865, *p.* 67.

93.—ON THE SURGICAL TREATMENT OF PAINFUL MENSTRUATION.

By Dr. J. Henry Bennet, late Physician-Accoucheur to the Royal Free Hospital, &c.

Menstruation may be painful, even actually painful, from its dawn to its close, without any mischief or impediment existing of any kind whatever. I believe there is a tribe of females, as it were, in whom menstruation is thus attended with pain, from physiological uterine sensitiveness, throughout all the phases of life, before and after marriage and child-bearing, and in the absence of any morbid condition. Only these women are very liable to uterine diseases ; with them the organ is a weak, sensitive one.

[In his clinical notes Dr. Marion Sims does not allude to Dr. Bennet's discovery of the existence of a sphincter at the os internum, separating the cavity of the cervix uteri from that of the uterus itself.]

This sphincter is formed by the circular fibres of the cervix, is very vital, opening and closing in connexion with menstruation, and probably with emotional conditions. It is generally closed during the interval of menstruation, so much so that a sound *does not* naturally pass into the uterus. It stops one inch and a half from the external os, and generally some force is required to overcome the resistance even in the healthiest females. I believe that the non-recognition of this internal sphincter is at the bottom of the very mechanical views which I now oppose. I may add that contraction of the cervical os is rare and easily remedied, and the cavity of the cervix is scarcely ever contracted without severe disease.

Dysmenorrhœa showing itself in women who have not had it before, or aggravated when constitutionally present, is, I firmly believe, very much more frequently the result of morbid conditions, of chronic inflammations of the cervix and of the body of the uterus, than of physical obstruction in the cervical canal. When that obstruction or contraction exists, it is usually the mere result of the swelling of chronically inflamed or hypertrophied tissues, and disappears without any operation when the inflammation has been removed, and the uterus has had time allowed it to fine down. So far from fibroid growths, which develop themselves in the walls of the uterus, and increase its volume, producing contraction of the cervical canal and orifice, and thus impeding the exit of the menstrual fluid, I have nearly always found that they dilate and open the os internum. Thus the free and easy passage of a large bougie into the cavity of an enlarged uterus at any time is, in my eyes, a strong reason for believing in the existence of a fibrous growth. The dysmenorrhœa in such cases is usually the result of the irritation produced in the uterus by the presence of the tumour.

The constitutional form of dysmenorrhœa, when not very severe, in my opinion requires neither medical nor surgical treatment: merely care, rest, and warmth at home. Marriage and childbearing sometimes modify the organic state of the uterus, and cure it naturally. If very severe, so much so as to cast a gloom over life, either in unmarried or in married women, it is usually connected with inflammatory disease of the uterus, which is also generally the cause of the narrowing of the cervical canal. The inflammation must of course be treated; and that subdued, the patient should be left to herself for some months, for the engorgement or hypertrophy of the uterus, which it has produced, to subside. As it does subside, generally speaking, the cervical passages open, and a natural cure is produced. If they do not thus open, dilatation really becomes necessary, and should be carried out in one way or another.

To accomplish this purpose—merely to establish a free communication between the cavity of the uterus and the vagina—I cannot see why, rationally, such severe operations as are now proposed and practised should be resorted to. I eliminate the idea of danger, because I think there is very little in the hands of experienced practitioners like Dr. Simpson and Dr. Marion Sims. But the operation as described by Dr. Marion Sims, and as practised by him and others, is a formidable one, which can and will only be undertaken by exceptionally skilled and experienced men. Is an operation which must remain in the hands of consulting practitioners the rational one, or necessary one, for the cure of a common, everyday uterine condition?

Such is the question that I would propose. Again, Why should the entire vaginal portion of the cervix be bifurcated down to the attachment of the cervix to the vagina, to remedy the narrowing of a small canal which passes through its centre? Why should the integrity of the circular fibres of the cervix, which have certainly something to do in pregnancy and parturition, be so seriously compromised—be cut right through in two regions? We must remember that, anatomically, as soon as the os tincæ has been passed, the sound enters a real cavity —the cavity of the cervical canal. The os itself can be dilated, or even slightly cut through if necessary, and then easily enlarged to almost any extent with the greatest case by bougies; and that accomplished, there is no contraction usually found until the internal sphincter or its vicinity be reached. The bifurcation, or even the simple division as Dr. Simpson practises it, of the cervix down to its vaginal attachments seems to me, in these cases, as unreasonable as it would be to divide the entire thickness of the gland of the urethra, in the male, down to the corpus cavernosum for a stricture of the outlet of the urethra.

Once the os internum or its vicinity has been reached, and it is judged that contraction really exists, and not mere spasmodic closure of a sphincter, what is to be done? Division is here very feasible and easy; but I do not see why it should be carried beyond a line on each side. Such a division gives very much more space than exists naturally, and allows a good-sized bougie to pass freely into the uterus. Twenty years ago Dr. Simpson, then in town attending a noble lady in her confinement, gave me his recently invented metrotome, which he praised in no measured terms. I thought myself that he had given me the philosopher's stone for dysmenorrhœa and sterility, and at once set to work. I divided the os internum, as above described, in very many cases, and never had any hemorrhage or accident. Indeed, I believe the hemorrhage is more the result of the slashing division of the vaginal cervix than of the division of the os internum. I was delighted with the success of the operation, and expected great things. But, to my regret, I found that when these patients came to me six months or a year after, the contraction was all but invariably worse than ever. The incisions had healed, contracted, and matters were worse instead of better.

I then adopted another plan. I divided as before, daily introduced a good-sized bougie to keep the parts open, and, after a week, introduced and left in the cervical canal one of Dr. Simpson's metal-stem pessaries as modified by myself. I curved them to suit the anterior congenital curvature of the uterus—which I believe, I was the first to recognise in the living,—and

diminished the size of the foot. I used to leave them twenty-four or forty-eight hours, then remove them for twenty-four or forty-eight hours, and so on for about three weeks more, to prevent contraction. In this way I obtained good and permanent results.

The above process, however, I found troublesome; it involved the slight operation, and the wearing the metallic pessary for several weeks, during which time I always felt rather nervous about the patient. So I reverted to the sponges, which I have mostly used ever since, and without one single accident, although I have applied hundreds and hundreds. But then I use precautions, which the physicians Dr. Sims quotes do not appear to have used. I *never* apply a sponge without previously ascertaining by a speculum examination that the cervix and its cavity are quite healthy. To dilate an inflamed cavity is to produce a storm. I never leave the sponge more than some twenty hours *in situ*, making the patient withdraw it herself by means of a string. I never use them more than an inch or an inch and a quarter in length, so as not to pass into the uterine cavity. I always leave one, two, or three days for the parts to recover between each application. I use very small tents, much smaller than those Dr. Simpson recommends: and I stop if the slightest irritation is produced. By these means I generally succeed, in the interval between two monthly periods, in opening out the entire canal, the os internum giving way last. The effect of this treatment, being gradual, is, I believe, more permanent.

I discard all metal dilators as irrational, and calculated to do more harm than good. It must be remembered that the cervix is more than a quarter of an inch thick, and of very firm, unyielding structure. What can be expected of an instrument that is intended to open a canal running through such structures by the expansion of two metal blades, if not that it should crush the tissues that give way? And such I believe is the case. I have seen many cases in which harm had evidently been the result of their use.

By using all the above precautions, as stated already, I have never had any accident of any description either by the sponges or by division.

I fully admit the necessity of the occasional dilatation of the cervix uteri; but adhere to the opinion expressed in my work seventeen years ago, that careful dilatation by prepared sponges is the safest and easiest plan, quite as effectual as the division, and has the advantage of being so simple that it can be carried out by any well-informed practitioner. As either this plan of treatment or simple linear division will do all that is required to re-establish the uterine passages when closed, I cannot accept

for that purpose the more severe and serious operation now proposed, save as a very exceptional measure.—*Lancet, June 24, 1865, p. 673.*

94.—ON THE OPERATION FOR THE RELIEF OF A LACERATED PERINEUM AND SPHINCTER ANI, &c., WITH SOME OF ITS COMPLICATIONS.

By Thomas Bryant, Esq., Assistant Surgeon to Guy's Hospital.

The principles of practice which have been laid down for plastic operations in the vagina, for the relief of the vesico- or recto-vaginal fistulæ, are in a measure applicable to cases of lacerated perineum, whether simple or complicated, for the objects of the surgeon in both classes of cases are very similar, and they are to be secured by the same ends, the means for obtaining them requiring only such modifications as the change in the situation of the parts affected necessarily demands.

The points which claim attention in this operation are not numerous, although they are most important; success being secured only by their close observance.

They may be described as follows:

The surgeon having carefully examined the parts, and determined the important question of how much of the lacerated perineum requires closure, should place his patient on her back in the lithotomy position, and map out the portion of the membrane which he intends to remove, with a sharp scalpel.

He must remember, as a point of primary importance, that the surface of the wound should be *clean and regular;* for it is essential to secure primary union of the two surfaces; the new perineum also, to be of permanent service, must be *firm, strong, and thick;* for if otherwise, the success of the case will be but partial or of little permanence.

To secure these two objects, a free and clean section of the lacerated perineum is absolutely essential; it cannot be made too smooth, nor can the surfaces to be placed in apposition for union be too broad posteriorly towards the rectum; at least an inch of raw surface is not too much, when it can be secured. the width of the bared surface diminishing slightly towards the anterior portion of the labia. The best plan to obtain these results is to perforate the parts towards the centre, and as it were slit them up with one sweep of a sharp scalpel; the right half of the perineum being first treated, and the left subsequently, the whole area having been mapped out previously by a bistoury.

This *first* step of the operation having been performed, the second, which is of no less importance, remains to be carried

out, and that is the bringing of the parts into apposition and keeping them there by sutures. Wire sutures are probably the best for these purposes, for if they do not cause less irritation than smooth silk they are at any rate more manageable. Each one should be inserted at least half an inch, or, better still, an inch from the margin of the wound, and brought out at its posterior border close to the vaginal mucous membrane; it should be then reintroduced at a corresponding point on the opposite side, and brought out at a spot similarly situated to the one at which it was introduced. When the recto-vaginal septum or sphincter ani has been lacerated, the introduction of the posterior suture is of critical importance, for it is an essential element of success that this septum should be likewise included and drawn forwards to the raw surface of the perineum by the suture. To secure this end the suture must be introduced, as already described, at a point situated on a horizontal line passing through this septum; the needle is to be dipped well into the thickness of the tissues, and instead of making its appearance at the posterior margin of the wound, close to the vaginal mucous membrane, is to be made to pass through the thickness of the recto-vaginal septum, and then out of the right buttock, at a point corresponding to the one at which it was inserted in the left side. When this is well done the wire or silk is buried completely in the tissues, and on being tightened the whole parts are drawn together, as it were towards a centre, corresponding to the anterior portion of the anus and posterior of the perineum. The other anterior sutures may be applied as already directed.

With respect to the necessity of dividing the sphincter ani in this operation, I will only add that I have not yet met with a case requiring such treatment.

The sutures need not be removed at too early a period, the eighth or tenth day being generally the best, but when good union has taken place, the practice of leaving them in position is certainly unnecessary, if not injurious. The *urine* should be drawn off at regular intervals, and the *bowels* kept quiet by means of opium. The ten-grain suppository of the compound soap pill, after the operation, is a valuable practice in this as in all cases of abdominal surgery, for it allays local spasms, keeps the bowels in a quiescent condition, and secures rest to the stomach, which, after chloroform, is so apt to be irritable. Perfect *cleanliness* is essential during the whole treatment of these cases; and the horizontal posture is to be maintained, the legs being tied together. The patient's diet should be liberal and much as usual.

Success in these cases depends much upon what are termed small matters, and it is of great importance to give them due

care and attention, for recovery may, as a rule, be secured in all these cases, however complicated.—*Guy's Hospital Reports, Vol.* xi., 1865, *p.* 270.

95.—TWO CASES OF OPERATION FOR THE CURE OF LACERATION OF THE PERINEUM.

Under the care of JAMES LANE, Esq., at St. Mary's Hospital.

[In the first case there was not a vestige of perineum to be found, the sphincter having been completely torn through. The patient was otherwise in fair health.]

The operation for restoration of the perineum was performed by Mr. J. Lane on the 5th of April, 1865. A portion of mucous membrane and skin was dissected off on each side at the entrance of the vagina, in a position corresponding to the original situation of the perineum. The raw surfaces thus made were about an inch and a half in length, about an inch in width inferiorly, but tapering to about half an inch in width superiorly. They were made to be continuous with each other posteriorly, at the point corresponding to the angle where the laceration had ceased. Four stout silver-wire sutures were then passed across deeply from one side to the other, and by means of these the deep portions of the denuded surfaces were firmly held together on the principle of the quill suture. The quills were represented by two ivory bars, perforated with four holes, through which the wires were passed and fastened. Four superficial sutures of thin silver wire were then applied to the anterior edges of the wound, in order to retain them in accurate contact. The sphincter was then divided freely in a direction outwards and slightly backwards on the left side.

For a week after the operation a grain of opium was given night and morning, for the purpose of keeping the bowels quiet; and the urine was drawn off twice daily with a catheter. Forty-eight hours after the operation the deep sutures were cut and removed together with the quills. Some slight œdematous swelling of the parts had taken place, but this soon subsided after their removal. The superficial sutures were not removed till the eighth day after the operation. At this period the union appeared to be tolerably firm. A free aperient was therefore given, and the bowels were emptied on the following day without any injury to the newly-united parts. After this, the tenderness of the parts rapidly subsided, and she was discharged from the hospital quite well on the 27th April, twenty-two days after the operation. There was then a firm and thick cushion in the natural situation of the perineum. Control over the motions was restored, and she expressed herself as having regained the natural sense of support and

security in the perineal region which she had lost since the accident happened.

Case 2.—A. R., aged 35, was admitted into St. Mary's Hospital on the 24th February, 1865, under the care of Dr. Tyler Smith, but was afterwards transferred to Mr. J. Lane for operation. She had been married six years, and had had three children. The rupture had occurred with the second child, when she was in labour for thirty-two hours. The head was very large, but instruments were not used. A detailed description is unnecessary, as the rupture was almost an exact counterpart, as to its extent, of that met with in the first case. A similar operation was performed on the same day (April 5th), with precisely the same after-treatment, and with a like result. She left the hospital quite well on the 28th April, twenty-three days after the operation.

Mr. J. Lane, in his clinical remarks, stated that these cases furnished excellent examples of complete rupture of the perineum. When the sphincter was torn through, as in both these cases, very great care and attention were required to retain the parts in accurate contact, because the action of the muscle was continually tending towards their separation at the lower angle of the wound. For this reason it was very desirable to paralyse its action for the time by an incision; but he believed it was sufficient to divide it on one instead of on both sides, as had been recommended. It was especially necessary to secure accurate union at the angle corresponding to the termination of the rupture, where the two raw surfaces became continuous with each other, otherwise there was the risk that an aperture might remain at this spot behind the new perineum; and though the perineum might be effectually restored there would be the inconvenience of a recto-vaginal communication behind it, a condition scarcely less annoying to the patient than that which the operation was intended to remedy. Mr. J. Lane said that he had used the wire suture and the perforated ivory bars for the last five years, during which time he had operated on, he believed, about thirty cases of rupture of the perineum of every degree of severity. He had every reason to be satisfied with the mode of operation, as he had not failed to obtain complete union in a single instance.—*Lancet, Sept.* 9, 1865, *p.* 289.

96.—ON VESICO-VAGINAL AND RECTO-VAGINAL FISTULA.

By Thomas Bryant, Esq., Assistant Surgeon to Guy's Hospital.

In the treatment of recto- or vesico-vaginal fistula there are two chief objects which the surgeon has in view.

First, to pare with nicety and accuracy the whole margin of the fistula; and, *secondly*, to bring into, and to maintain in, close apposition the raw and incised surfaces. If these two ends be secured, the means by which they are attained are comparatively of small importance, although their simplicity is a point of considerable value. The chief difficulties of the operation are, it is allowed, generally met with in carrying out the first object we have mentioned, and its ultimate success most unquestionably depends upon the mode in which this step has been performed; for, however well the second step in the operation may be executed, failure must ensue if the first has not been fairly accomplished. The hope and aim of the surgeon in these cases is to secure union of the pared edges of the fistula by primary adhesion, and to obtain this result two clean and even surfaces must be placed and kept in apposition. Surgeons who have attempted to pare a fistulous opening, situated either on the surface of the body or in the vagina, well know what care is demanded to prevent any irregularity or raggedness of the wound's surface, and they well know that if this irregularity exists, primary adhesion of the edges cannot take place. It is this difficulty which, I believe, too often necessitates the repeated operations we hear of for the cure of a vaginal fistula; and it was to obviate such that I was led some four years since to the construction of instruments (modifications of that formed by Mr. Hilliard, of Glasgow), and which subsequent experience has fully proved to be of great value. I have reason to know that in other hands as well as in my own they have been equally servicable, and that they have tended to facilitate the performance of a difficult operation, and render it more certain and satisfactory.

[The instrument consists of a handle to which are adaptable six guides, three for transverse and three for vertical fistulæ. In each of these two sets there is one with three prongs, one with two, and one with only one prong. In the set for transverse fistulæ these prongs are in the same line as the handle, whilst in that for vertical fistulæ they are at a right angle. In both sets the prongs are set in a bar in the same manner as the prongs of a rake.]

The advantages which are gained by the use of the instrument, are, *first*, the certainty with which the whole margin of the fistula is incised; and, *secondly*, the accuracy with which the width, length, and evenness of the incision is secured.

The following are the directions for its application:

Assuming that an operation for vesico-vaginal fistula is to be performed, and that the fistulous opening is an inch long, the guide with three prongs should be selected, its width being

sufficient to include the whole upper margin of the opening. The extent of surface to be pared should then be mapped out with a scalpel, a third or half an inch of raw surface being desirable when it can be obtained, and the prongs of the guide inserted at the edge of but not through the mucous membrane of the bladder, and passed *between* the tissues, beneath the vaginal mucous membrane to the required extent; the ends of the prongs should then be made to perforate the mucous lining of the vagina, at the line of incision already made by the scalpel, and with a blunt hook the tissues thus included should be well pressed down to the prongs' base; the whole of this surface thus raised by the guide is then to be excised by one sweep of the scalpel, passed along close to the posterior margin of the instrument.

By this means the cleanness of the wound is guaranteed, and its extent accurately determined, not the slightest fingering or chance of causing any irregularity in the wound's surface is experienced; indeed, with the exception of the subsequent introduction of the needle, no instrument need touch the surface of the wound a second time. The lower margin of the fistula should then be treated in the same manner as the upper, thus completing the first and most important step of the operation.

The second step of the operation remains to be described, and although it may be equal in importance to the first, it is not one of difficulty, yet at the same time it requires some nicety in execution. The object is to bring the raw surfaces of the fistula into close apposition, and to maintain them there. This is to be carried out by means of sutures, the wire being the most convenient. The sutures should be sufficiently close to ensure the accomplishment of the object for which they are introduced, and may be fastened in any way which the operator prefers. The perforated shot applied to the twisted end of the wire answers every purpose, both fixing the wires and protecting their points. There is one point, however, of essential importance to be remembered in this the second step of the operation, and that is the distance at which the sutures are to be inserted from the margin of the wound; as a rule, the greater the distance the greater the advantage to be gained—a third, or half an inch or more being desirable. The edges of the wound are not to be adapted too tightly, for swelling will occur, and, as a result, ulceration in the line of suture is sure to follow. This point is as essential in all plastic operations as in the one we are now considering.

The sutures may be left in for six or eight days or more; but I believe it best to remove them as soon as the wound is healed, no good object being obtained by leaving them longer, and in

some cases ulceration may be set up, which may interfere with, if not mar, the ultimate success.

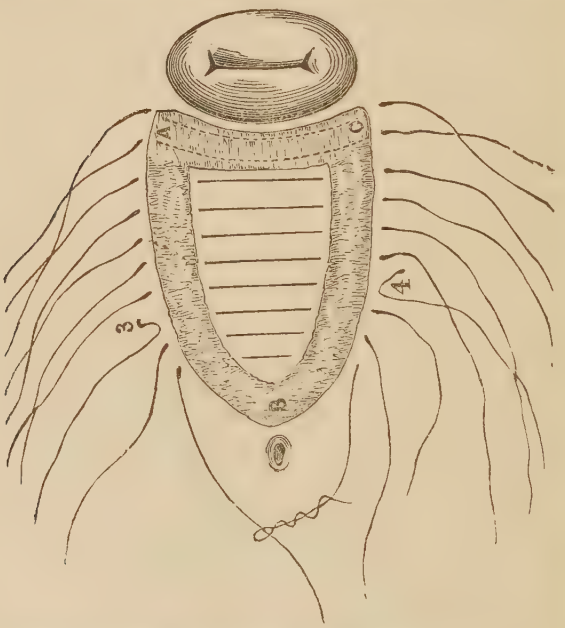
The urine should be drawn off periodically after the operation, but it is not necessary to irritate the bladder by retaining the catheter in it.

A good opiate suppository should be given to relieve pain or local spasm, and perfect cleanliness is to be enforced during the treatment.—*Guy's Hospital Reports, Vol.* xi., 1865, *p.* 259.

97.—A RADICAL OPERATION FOR PROCIDENTIA UTERI.

By Dr. Thomas Addis Emmet, Surgeon to the State Woman's Hospital.

In September, 1862, Mrs. C., aged 30, the mother of four children, was admitted to the hospital with complete procidentia of ten years' standing. She had been frequently irregular,



and, during the first examination, the attending physician having passed the sound, a miscarriage took place soon after at

the third month of pregnancy. On the 10th of October following I proceeded to operate, by removing the mucous membrane from the base of the bladder, in two broad bands, extending from the point B., a little behind the urethra, to A and C, on each side of the cervix, as recommended by Dr. Sims.

The scarified surfaces were then connected from A to C, just in front of the cervix uteri, for the purpose of closing the pouch; thus forming, when brought together, a firm, unyielding support, and rendering it impossible for the neck to slip behind the septum.

The two sutures nearest the cervix uteri were passed as a running stitch, so as to include as nearly as possible the entire scarified surface of the transverse section. The others, from above downwards, were made to skip over the undenuded triangle, and only to embrace the opposite scarified surfaces. The last one, however, at the neck of the bladder, passed from side to side, including the whole tissue, as at the cervix uteri. Thirteen interrupted silver sutures were used; they were removed on the thirteenth day, and the case discharged cured November 2.

Ten months afterwards she was delivered of a very large child, and had a natural labour. Several months after her delivery I made an examination, and found the organ in a healthy condition, with no trace of the operation remaining in the vagina. By passing a sound into the bladder, and the finger approximated by the vagina, it was demonstrated that the base of the bladder had regained its natural thickness.

On inquiry, I learn that, up to the present time, she is in perfect health, and has continued to follow her occupation as a washerwoman, with no recurrence of the procidentia.

Mrs. P., aged 63, the mother of eleven children, was admitted December 31, 1862, with complete procidentia of twenty years' standing. She was operated on the next day, as in the previous case, using eighteen sutures. She proved very unruly, refused to take any opium, and constantly made the most violent efforts in straining, with the idea that a movement of the bowels was imminent. The sutures were removed on the fourteenth day, a perfect union had taken place, and she was discharged cured February 14, 1862.

Eighteen months after the operation she visited the Institution for examination. It was found that all traces of the operation had disappeared, with the exception of a small fold remaining in front of the cervix uteri. Up to the present time there has been no return of the procidentia.

May 6, 1863, Mrs. H. (the case already mentioned as having been previously operated on by Dr. Sims,) again presented herself for relief. It was now impossible to disengage the neck,

as the septum had become stretched sufficiently to admit behind it a large portion of the uterus.

May 11, the case having been prepared for the operation, the septum was divided (about two inches in the median line,) from above downwards, sufficiently to extricate the neck. A surface was then denuded in front of the cervix, (from A to C, as shown in the diagram,) connecting the divided edges of the septum. The uterus was then replaced in position, and the surfaces brought together by fourteen sutures. They were removed on the eighteenth day, and the case discharged cured, June 14.

A year afterwards she reported herself well, with a promise to return on any recurrence of the difficulty.

Mrs. C., aged 26, was admitted June 22, 1863. The procidentia was of five years' standing, and complete. Three months after the birth of her only child, the uterus escaped from the vagina, and had never been returned. June 29, the operation was performed, using sixteen sutures. They were removed on the eleventh day, and the case discharged cured, July 20, 1863.

Mrs. W., aged 64, a nurse by occupation, was admitted Nov. 24, 1863. The procidentia was complete, and for many years had been unreduced. It came on immediately after the birth of her only child, at that time about 25 years of age. Thirteen sutures were used; they were removed on the ninth day, and the case discharged cured, December 18.

This patient, in excellent health, reported herself for examination December 15, 1864. As in other cases, no trace remained of the operation, with the exception of a slight ridge or fold in front of the cervix, and this even could only be detected by means of the finger.

Mrs. O., aged 27, the mother of two children, the eldest being six years of age, was admitted January 5, 1864. A few hours after delivery, she got up for the purpose of washing her clothing. She soon felt the descent of the uterus, but the procidentia did not become complete for six months afterwards. In 1862, she again conceived, and states positively that the procidentia remained unreduced from the first occurrence, until the latter months of pregnancy, and recurred immediately after delivery. On admission, the sound passed nearly four inches to the fundus, and the neck was immensely hypertrophied. January 16, I operated, using seventeen sutures. They were removed on the 12th day, and the case discharged cured, February 14, 1864, with the promise to report herself if any recurrence took place.

Mrs. S., aged 64, admitted January 25, 1864. She was the mother of eight children, the youngest being twenty years of age.

On the eighth day after delivery, she got up, and shortly afterwards began to suffer from a partial prolapse, but it was several years before the uterus escaped entirely from the vagina. For five years previous to admission, it had been unreduced, and during that time the necessity always existed for a partial reduction, before the bladder could be evacuated. January 25, the operation was performed, using fourteen sutures. During the night, she got up and walked about the ward for several hours, and continued, in spite of all remonstrance, to follow her own inclination. On the twelfth day, it was discovered that four sutures (near the neck of the bladder) had torn out, and through the gap a portion of the relaxed base of the bladder protruded. The sutures were all removed at the time, and every hope of success abandoned. Before her discharge, it was found on examination that the entire line of union had gradually parted, with the exception of the cross scarification, in front of the cervix uteri. The fold thus formed, (as in a sling) had retained the organ perfectly in place, although below a cystocele existed. The result was attributed to the fact of her being of a spare habit, with a vagina short, in consequence of her age. I have been informed within a few weeks, that there has been no return of the displacement, and, although partially in her dotage, she continues still to lead an active life.

Future experience must demonstrate how far the formation of this fold can alone be relied on under other circumstances; yet it is evident that in many cases this will prove all that is necessary to retain the uterus in situ. When atrophy of the organ has taken place, and the vagina shortened consequent upon a change of life, it is believed, after this fold is formed, that no great amount of the vaginal wall can prolapse.

Mrs. D., aged 42, the mother of eight children, was admitted February 8, 1864. On the third day after the birth of her first child (fourteen years previous to admission), she got up, and the uterus came down to the outlet of the vagina at once. Complete procidentia gradually resulted, and continued unreduced, except during pregnancy. A change of life had already taken place some two years previous to admission. The operation was performed February 10, using sixteen sutures; they were removed on the tenth day. The four lower ones were found to have cut out. The surface, however, gradually healed by granulation, and the case was discharged cured, March 1, 1864.

Mrs. P., aged 39, the mother of two children, was admitted April 5, 1864. Four years previous to admission, (while pregnant with her last child,) the uterus remained very low down in the vagina. At the eighth month it partially protruded, and

remained in this position until a few hours before delivery. She confined herself to her bed for six weeks afterwards, but immediately on getting up the procidentia became complete. Operated June 12, using seventeen sutures. They were removed on the tenth day, and the case discharged cured July 4.

Mrs. S., aged 41, the mother of two children (the youngest twelve years of age,) was admitted May 12, 1854. The procidentia had been complete for nine years, but she was able to reduce it herself, and was comfortable by retaining the uterus within the vagina by means of a bandage. The operation was performed May 24, using sixteen sutures, and the case discharged cured June 20 following.

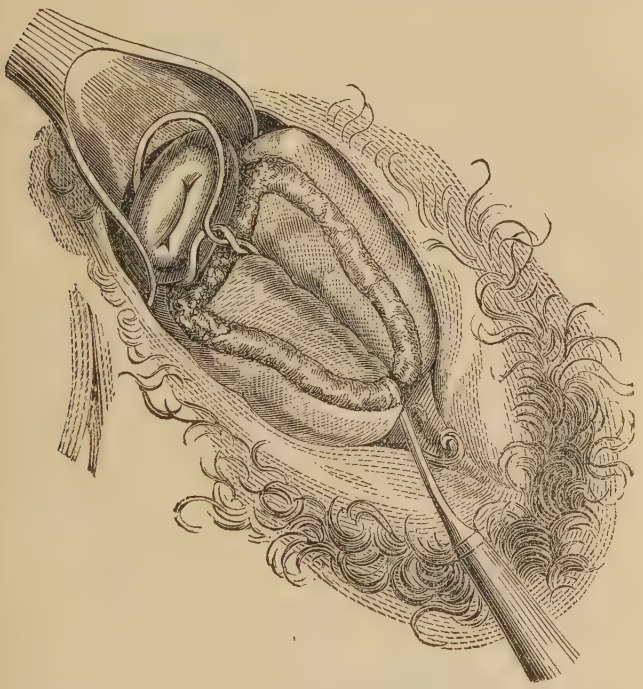
Since October, 1862, I have operated by this method in public and private practice on seventeen cases successfully, and with every reason to believe that there has not been a single recurrence of the difficulty. I have avoided giving the history of any but of those residing in the city or immediate neighbourhood, where a frequent examination has been possible, and their exact condition known at the present time. In other cases failure has resulted ; but in every instance it was in consequence either of great tension, from including too much tissue at the time of operating, when the result was often anticipated, or to a want of necessary care on the part of the patient afterwards.

Previous to the operation, if much excoriation exists, it is necessary to reduce the procidentia, and keep the patient in bed for a few days. One or two applications of a weak solution of the nitrate of silver will usually heal any excoriated surface ; and large vaginal injections of warm water, night and morning, will be sufficient in a short time to remove the dry and scaly condition of the long exposed surface. If more than this is necessary, after each injection a portion of damp cotton should be used, thoroughly saturated in glycerine, and carefully spread out so as to come in contact with the entire canal, the whole being kept in situ by a bandage. This will by the watery discharge induced, greatly lessen the congested condition of the blood vessels, and so corrugate the vaginal walls, for the time being, as to afford quite a support to the uterus.

The patient having had the bowels thoroughly moved the night before, should be placed for the operation on the left side, in Sims' position for the operation of Vesico Vaginal Fistula, or uterine examination, and his speculum used.

It is often exceedingly difficult to keep the proper line for scarification, in consequence of the mobility of the parts. The process, however, is greatly facilitated by an assistant, firmly depressing the prolapsed base with a sound, directly in the

median line—a resort often made use of by Dr. Sims. But, even when the assistant is accustomed to the operation, the sound will frequently slip to either side of the cervix uteri. This being generally hidden from view, and having no other guide, the scarification will be found deflected. To obviate this, I often bend the end of a flexible plated copper sound, in a circle sufficiently large to slip over the neck as a collar, and again properly curved on itself, so as to keep up the base at the



same time. I am now having an instrument made for the purpose of disconnecting the collar from the shaft. After the two sutures nearest the neck have been introduced, the passage of the others would be greatly facilitated by preserving the relative position of the parts until all have been passed. It can then be disjointed and withdrawn, as a staff, without difficulty, and the sutures secured. On referring to the plate, it will be observed

that the usual pressure exerted by the instrument has been lessened for the purpose of showing its application ; by so doing the parts have rolled out, and the scarified surfaces have become proportionately separated. To appreciate the condition represented, it must be borne in mind by those who are not familiar with the position, that the patient is represented as lying on the left side.

It is evident that the sulcus produced by this instrument must be very nearly in the median line, and the cervix held in position at the end of the vagina. Along the edge of the sulcus formed, a broad strip of the mucous membrane should be denuded, extending (as we have shown) from the neck of the bladder to just beyond the cervix on each side. The instrument is then removed, and the uterus drawn down with a tenaculum, for the purpose of making the transverse or connecting line of scarification in front of the neck.

For removing the mucous membrane, I have been in the habit of using various curved scissors. As the hemorrhage is sometimes excessive, the surface can be thus removed more rapidly than with the knife.

The sutures in the transverse section should be passed with great care, and as nearly continuous as possible. The surface is too long a one to be embraced by a single needle, so that at each stitch the point must be inserted again near the exit of the preceding one. Otherwise, instead of smooth surfaces being approximated, they will be brought together as by a purse string.

I have had a needle made for use in this operation, as well as for vesico vaginal fistula, short, round, and slightly curved near the point, of different lengths, which experience has demonstrated to be preferable to all others. In this form a punctured wound is made, and with no hemorrhage, as often follows the flat needle, with a cutting edge.

It is well, immediately after the silk loops of the first sutures have been passed, to attach the silver wire and draw them through. From the length of the operation, the silk, from being so long saturated with blood, becomes weakened, so that if the passage be delayed until all have been introduced, it will often break, from the resistance in drawing it through so continuous a line. The remaining ligatures should then be passed in rotation (at an average of four or five to the inch), each skipping over the undenuded triangular space, until the apex at the neck of the bladder has been reached.

It is worthy of note, that the want of a uniform success in the application of silver sutures, may be attributed to the use of too small a number, the insufficient amount of tissue included by them, and to strangulation. Each suture should be passed

as to the points of entrance and exit, as nearly parallel as possible to the previous one. But the same care is not so necessary in relation to the relative distance from the edge of the scarification, provided the sutures are afterwards properly secured. Reference is here made more particularly to this operation; for it is exceedingly difficult always to bring the point of the needle out, exactly at the same distance from the edge as that of entrance on the other side. Consequently, the amount of unscarified tissue approximated with the denuded surface must be in proportion to the difference, and either no union takes place or to an extent insufficient to be permanent. Before twisting, this may be obviated by bending a shoulder on the suture at the same point as would correspond with that of entrance from the edge, on the opposite scarified surface. This will be more readily understood by reference to the diagram. It will be observed that the sutures (3 on one side and 4 on the other) have been bent in this manner, and what the obvious result would be, if twisted together, without this expedient.

In some cases, from fifteen to twenty sutures are required, with double the number of ends projecting from the vagina; they become tangled together and prove a source of great embarrassment to the operator, long before the requisite number have been passed. Dr. Sims' usual method was to make a number of incisions into the side of a piece of soft wood, and, in rotation, from one end to the other, each pair of sutures were embedded in a separate slit. He sometimes also used a small comb for the same purpose. The facility thus given by some such expedient can alone be appreciated by the operator, as the order is preserved, and each suture remains undisturbed, and until required in turn to twist.

I prefer, however, to pass each wire through a loop made at the other end, as shown in the diagram, by the suture nearest to the neck of the bladder. It is then gently drawn through, until the looped extremity is about the necessary length to twist, and the single end is then passed behind the upper side of the speculum, to the assistant holding it. By passing the sutures from above downwards, each is thus gotten entirely out of the way. It is true that the same order is not exactly preserved. But, by beginning to twist the sutures in turn, from below upwards, each, when needed, can be readily separated from the others by a little traction on the wire, just above its loop.

They should be twisted just sufficiently to approximate the edges, and never in the line by which they have been passed, or strangulation of the parts cannot be always avoided. Having been grasped by the forceps and drawn firmly over Sims'

Fulcrum, they should be bent at nearly a right angle over it, and twisted only up to this point.

They are then to be cut off at about half an inch in length, and bent over flat, alternating to the right and left. This order is of some practical importance, as the sutures frequently become imbedded, and, if not all removed, may become, months afterwards, a source of inconvenience.

After the patient has been placed in bed, the bladder should be emptied. The after treatment is confined to giving opium in sufficient quantity to constipate the bowels, and to regulating the diet with the same view. The urine should be drawn off regularly, and, after the second or third day, the vagina carefully syringed, night and morning, with tepid water.

The sutures are generally removed from the tenth to the fourteenth day, and may be allowed even to remain longer, if a large surface has been turned in. The patient should be confined to the bed for about three weeks after the operation, and the bowels constipated, if possible, for the same length of time. After a dose of castor oil (before a movement of the bowels takes place), it is advisable to throw into the rectum a few ounces of sweet oil or flaxseed mucilage. When it has been deemed judicious to remove the sutures at an earlier day, the same necessity for constipating the bowels no longer exists.

The term "narrowing the vagina," in connection with this operation, is objectionable, as only the surplus tissue is included by the sutures. The vagina is in fact only restored by the operation to its natural size. For if, by accident, the scarification is extended beyond a given point, the tension is so great that the sutures invariably cut out. The only change made from a normal condition, is the formation of a fold in front of the cervix uteri. This, however, gradually disappears, and, as we have shown, (even soon after the operation), offers no impediment to the progress of labour. The parts turned in, being relieved of all tension, retract and become blended together, so that the natural thickness of the base of the bladder is gradually regained.

By the same principle, cystocele and rectocele, (in fact often but the first stages in procidentia) can be even more readily relieved. The form of scarification, however, is somewhat modified. For rectocele, the form is an ellipse, extending from a point within the fourchette, as far upward as necessary. For cystocele, the scarification is more that of an oval, and should be extended from the neck of the bladder to the cervix uteri.

In presenting this method to the profession, (a natural sequence to the previous labours of others,) it is not advocated that all cases of procidentia should be subjected to this rather

formidable operation; for it is a well known fact, that many cases of recent origin recover perfectly by rest in the recumbent position, astringent injections, and other suitable means. But it should be resorted to beyond this point; when the uterus has become hypertrophied, and before it has remained outside of the vagina for years, unreduced; before the vagina has lost entirely its contractile power, through the usual systematic course of stretching by pessaries, each from necessity being larger than the previous one in use. After the condition has become hopeless, all efforts for relief have been abandoned, and the patient has become more or less incapacitated for the performance of her daily duties—in such cases, (so long an opprobrium to the profession), it is believed that at length a definite result has been gained for this otherwise intractable condition.—*New York Medical Journal, April* 1865, *p.* 1.

98.—ON A CASE OF OVARIOTOMY IN WHICH THE CYST WAS IN A STATE OF GANGRENE.

By Thomas Keith, Esq., Edinburgh.

[Though the practice in the following case seemed at the time to be rash and scarcely justifiable, yet it saved the life of the woman, and it appears to be one which may be sometimes recommended when bad symptoms come on after tapping. Symptoms indicative of low cyst inflammation came on a few days after tapping, and it was determined to give the patient a chance of life by the prompt removal of the tumour.]

I confess that, on uncovering the abdomen after she was under chloroform, I almost hesitated to proceed, for the intestines were now very much distended. The cyst was exposed midway between the umbilicus and pubes, and as far as the finger reached was unattached. About half a gallon of fluid, which had accumulated in the cyst since the tapping, was withdrawn, and its gangrenous odour was at once perceived by all who were present. The aperture made in the cyst was then carefully closed, the incision was enlarged upwards and downwards, and very extensive intestinal adhesion came at once into view. There was no parietal adhesion except over a space the size of the hand, close to the false rib on the left side. This was very firm, and the bleeding from it very troublesome. The adhesions between the different folds of small intestine and to the tumour were of greater extent than I had ever met with before and embraced the whole of the posterior surface of this large cyst; while the transverse colon was attached by recent lymph to its upper margin. The intestines were of a dark-cherry colour, and in a high state of inflammation; their

swollen, spongy, friable condition was very remarkable, and it required the utmost care and tenderness in effecting their separation from the posterior wall of the cyst, which was of a very dark colour. After an hour the whole mass of cysts was turned out, but of course the recent adhesion that existed in all directions between the different coils of bowel was not interfered with. The operation had been sometimes most embarrassing, for the bleeding was profuse, and, from the constant straining of the patient from the chloroform sickness, the swollen intestines were continually being forced downwards, obscuring the view, and pushing out of sight the newly separated bowel, often before I had satisfied myself that the bleeding had ceased. Numerous clots were then removed by passing several sponges of special softness in all directions amongst the viscera; but it was impossible to bring all the separated surfaces into view, from the amount of adhesion that existed between the different folds of bowel themselves. The blood was allowed to gravitate into the pelvis, and thence removed, though several small clots must have been left behind. The oozing from the separated parietal surface gave a good deal of trouble, and it was necessary to keep up pressure on it by the hand, and allow a large flat coagulum to form, which was left adhering to the wall. The pedicle was thick and of fair length; but, from the unusual size and depth of the pelvis, and the distended condition of the abdomen, there was a considerable strain upon the uterus when it was secured by the clamp. The wound was then closed by deep and superficial silk sutures, and it was remarked, as the last look was taken of the intestines—glued together as they were with shreds of recent lymph visible in all directions,—that they were now, from the local bleeding they had received, of nearly their normal colour. The patient was under chloroform for nearly two hours.

The cyst-walls weighed 8½ lbs., and the large cyst had contained upwards of 49 lbs. of fluid; so that the weight of the whole tumour was 57½ lbs. On opening the large cyst, it was found in a complete state of decomposition. Its anterior wall, which was half an inch in thickness, was lined with a very thick layer of recent fetid lymph. The greater part of the posterior wall was in a state of complete slough, extending through to its serous covering. The base of the tumour was about an inch and a half in thickness, and was of cartilaginous hardness.

[The improvement that followed was remarkable; she was out of bed in three weeks. This was Mr. Keith's twenty-fourth case of ovariotomy in two years, and the eighth successful case in succession. Of these 24, six died, eighteen recovered and are now in good health.]—*Lancet, July* 8, 1865. *p.* 36.

Art. 99.—ON CHOLERA: ITS PATHOLOGY AND TREATMENT.*

As this formidable disease is once more amongst us, we will again, as we did in 1848, collect some of the most important information respecting it: especially with regard to its Pathology and Treatment. The history of cholera may be very interesting and its cause mysterious, but it is our chief duty in this volume to give such information as may be especially available and useful at the bedside. We have learned much both as to its nature and treatment from our own observations in all the attacks of this disease since about 1832, and from the experience of others: we have learned how to avoid opium, stimulants, and other kinds of treatment which used to be the fashion; we have learned that from some mysterious poison acting at first apparently on the organic nerves, and then on many of the cerebro-spinal nerves, the arterial system becomes violently and spasmodically contracted—the capillaries at one end, and the pulmonary artery and its branches at the other end—so as to collect nearly all the blood in the great central veins, causing the most rapid collapse, and almost completely impeding the circulation through the lungs. We shall make extracts from the papers of Dr. Bell, Dr. G. Johnson, and others, so that our opinions may be coincided with or not. It appears most probable that the subtle poison acts, either through the blood primarily or through the nervous system, especially on the organic nerves, the sympathetic, which supply the contractile power to the arteries, the intestinal canal, the organs of respiration, including the muscles of voice—producing a kind of tetanic contraction, thus emptying all the capillaries into the great central veins. In fact it seems to us to be a kind of *tetanus*. We all know what a small portion of strychnine will act on the body, and why should not a similar effect be caused by the poison of cholera; but on rather different parts of the nervous and muscular systems from those acted upon by strychnine? If we take this view of the disease, we see at once the reason why some of the most successful modes of treatment went on the principle of relaxing spasm, such as bleeding, emetics, the injection of warm water and salines, and especially chloroform; we also see the bad effects of opium and stimulants given alone. The *combination* of such measures as relaxed spasm, with

* This paper on Cholera is reprinted for distribution, price 6d.

careful stimulation was often indeed successful, but not stimulants alone. The virulence of the poison is indeed so great in some cases, or the patient is so feeble to begin with, that the first attack of spasm may be so short as not to be perceived, and may have entirely passed off before the physician has seen him, leaving the patient in that stage of collapse which seems almost hopeless. We would therefore particularly point out to our readers that the successful treatment by chloroform and other antispasmodic remedies is only applicable in the first spasmodic stage, or when this spasm of the organic and voluntary muscles continues to come on. At the time Dr. Bell treated these cases by bleeding, chloroform was not in use. Bleeding, then, was the most rapid and powerful means of relaxing spasm of all muscles, —chloroform has now almost entirely superseded it. The paper which seems to us to have thrown most light on this disease, was published by Dr. C. W. Bell, Physician to the Manchester Infirmary, and late Physician to H.M. Embassy in Persia. When the reader has read this paper and the succeeding one by Dr. George Johnson, he will be struck with the similarity of views. Although Dr. Bell thinks that the spasm is chiefly in the capillaries, thus emptying all their blood into the great central veins, and Dr. Johnson thinks the contraction is in the branches of the pulmonary artery, yet both seem to think that the fault is in the muscular contraction of more or less of the arterial system. For our own part we think the spasm attacks all the organic muscles, and most of the voluntary, and seems to be tetanic. Dr. Bell's paper will be found more at large in *Retrospect*, vol. xvii., extracts from which we shall give as we proceed.

The views of Dr. George Johnson, of King's College, coincide in many points with those of Dr. Bell, although we suspect that he never read Dr. Bell's paper, for in another lecture he says that Bell, Orton, Scot, &c., "none of these writers have any very definite pathological theory. They looked upon cholera as a disease chiefly of the nervous system." We were surprised to read this opinion of Dr. Johnson, and we think that he will alter it should he read this paper. Dr. Johnson says :—

"What is the pathological explanation of this remarkable train of symptoms? The one great central fact is this, that, *during the stage of collapse, the passage of blood through the lungs from the right to the left side of the heart is, in a greater or less degree impeded.* Let us now consider the evidence of there being this impediment to the pulmonary circulation ; and let us endeavour to ascertain the probable cause and consequences of this obstruction to the flow of blood. Very conclusive evidence as to the existence of impeded pulmonary

circulation during life is afforded by the appearances observed in the heart, blood-vessels, and lungs after death. The *post mortem* appearances within the chest have been described, with more or less minuteness, by several authors; but by no one, I believe, with so much care and accuracy as by Dr. Parkes. (*Researches on the Pathology and Treatment of the Asiatic or Algide Cholera.*)

"In the great majority of cases in which death has occurred during the stage of collapse, the right side of the heart and the pulmonary arteries are filled, and sometimes distended, with blood; while the left cavities of the heart are generally empty, or contain only a small quantity of blood; the auricle being partially and the ventricle completely and firmly contracted. The tissue of the lungs is, in most cases, of pale colour, dense in texture, and contains less than the usual amount of blood and air. With respect to the extremely anæmic condition of the lung, when death has occurred during the stage of collapse, there is an entire agreement amongst those authors who have most accurately described the *post mortem* appearances. There is something surprising, as Briquet and Mignot observe (*Traité Critique et Analytique du Cholera Morbus*), in the contrast between the almost constant occurrence of this extremely anæmic condition of the lung, from which scarcely even a few drops of blood flow when the tissue is cut, and the hyperæmia of most of the other viscera.

"There is a remarkable contrast, too, between this anæmia of the lung when death has occurred during collapse, and the great engorgement of the lungs which is almost invariably found when death occurs in the febrile stage which often follows reaction.

"Now, it is evident, from the appearances here described that, during the stage of collapse, there is an arrest of blood in the branches of the pulmonary artery *before* it has reached the pulmonary capillaries. The arrest at this point explains the remarkable anæmia of the texture of the lungs, while the hyperæmia of the lungs after reaction is due to engorgement of the pulmonary capillaries. Before I attempt to explain this remarkable arrest of blood, it may be well to allude briefly to certain phenomena in the living but collapsed patient which afford confirmatory evidence that the pulmonary circulation is greatly impeded. The impeded flow of blood through the lungs resulting, as it must, in a very scanty supply of blood to the arteries, accounts for the character of the pulse in cholera. It accounts, too, for the fact that the pulse has often been observed to increase in power and volume under the influence of venesection, which, by relieving the over-distension of the right cavities of the heart, increases

their contractile power. (See Dr. Reid's essay *On the Effects of Venesection in Renewing and Increasing the Heart's Action under Certain Circumstances.*)"*

"I believe the true explanation of the arrest of blood in the lungs to be this. The blood contains a poison whose irritant action upon the muscular tissue is shown by the painful cramps which it occasions; the blood thus poisoned excites contraction of the muscular walls of the minute pulmonary arteries, the effect of which is to diminish, and in fatal cases entirely to arrest, the flow of blood through the lungs.

"We have seen that the condition of the lungs after death during collapse affords conclusive evidence that the arrest of the blood occurs, not in the capillaries, but in the branches of the pulmonary artery, before the capillaries are reached by the blood. We know that the walls of the arteries are muscular, and that they have the power of contracting upon their contents under the influence of a stimulus, such as cold, electricity, or mechanical irritation. I suppose that no physiologist at the present day would deny that spasm of the arteries is as real a fact as spasm of the muscles."†

"The most interesting and conclusive evidence that arrest of blood in the lungs is the true key to the pathology of choleraic collapse, is to be found in the simple yet complete explanation which it affords of all the most striking chemical phenomena of the disease—the imperfect aëration of the blood, the fall of temperature, the dark and thickened appearance of the blood, and the suppression of bile and urine.

"*Chemical Consequences of the Obstructed Flow of Blood through the Pulmonary Arteries.*—It is obvious that the stream of blood from the pulmonary capillaries to the left side of the heart is the channel by which the supply of oxygen is introduced into the system. One necessary consequence, then, of a great diminution in the volume of blood transmitted to the left side of the heart, must be that the supply of oxygen is lessened in a corresponding degree. This position probably will not be disputed by any one who will give the subject a moment's consideration. Nor, again, can it be denied or doubted that certain results must of necessity follow this limited supply of oxygen.

"The combustion of those constituents of the blood which are normally subjected to the action of oxygen will be diminished in proportion to the deficiency of that gas; and thence follows simultaneously and of necessity a reduction of temperature, and so scanty a formation of urinary and biliary constituents, that, while the state of collapse continues, the functions of the kidneys

* British Med. Journal, Nov. 11, 1865, p. 491. † Ibid, p. 492.

and liver are virtually suspended. The blood at the same time has that black, thick, treacly appearance which is not peculiar to the collapse of cholera, but which is common to it with all diseases which are attended with a defective aëration of the blood. The blood has this character during the cold stage of a severe ague fit. Dr. Mackintosh and others, who have bled patients during the cold stage of ague, describe the blood as flowing from the arm at first in a slowly trickling stream, being of a dark colour, and not coagulable. (See Mackintosh's *Practice of Physic*, vol. i. p. 86 *et seq.*) Dr. Dundas Thompson, who published an elaborate paper on the Chemistry of the Blood in Cholera (*Med.-Chir. Trans.*, vol. xxxii, p. 67), states that one specimen of blood from 'a patient who laboured under an affection of the mucous membrane of the air-tubes', contained a greater excess of solids, in proportion to water, than he had found even in cholera-blood.

"The blood in cholera is black and thick only during the stage of collapse; in other words, during the stage of pulmonary obstruction and defective aëration. This state of the blood bears no relation to the loss of water; it comes on when the loss of water has been very trifling; it passes off rapidly, while loss of water by purging continues unchecked. It is simply a result of defective aëration, just as the thick and smoky flame of a lamp is a result of defective aëration.

"The constituents of bile and urine and carbonic acid are all results of oxidation; none of them can be formed without a large supply of oxygen. Suppression of bile and urine during the stage of collapse is a necessary consequence of the limited supply of oxygen which results from the obstruction in the lungs. The amount of carbonic acid expired during collapse is also much diminished. (See, on this point particularly, Twining's *Clinical Illustrations*, &c., 2nd ed., p. 15.) One fact confirmatory of the view that the very scanty formation of bile, urine, and carbonic acid during collapse is a result of the diminished supply of oxygen, is, that *the secretion of milk continues apparently undiminished.* I have myself observed this fact, and it has been mentioned by several authors. Thus Magendie states that, one of his patients having been delivered of a child a few days before she was seized with cholera, the secretion of milk continued so abundant through a first and a second collapse, which ended fatally, that it was necessary to empty the breasts, in order to relieve the pain which their distension occasioned. Now, if the other secretions are suppressed on account of the deficiency of water in the blood, why does the secretion of milk continue? Magendie says, because the blood reaches the breasts, and supplies the materials for their secretion, on account of those glands being nearer to the heart than the liver and

kidneys, which, being at a greater distance, do not receive the supply of blood necessary for the discharge of their functions! My explanation of this remarkable and instructive fact is simply this. The chief constituents of milk—casein, sugar, oil, and water—may be obtained from the blood without the addition of oxygen. The secretion of milk, therefore, continues during the stage of collapse; while the highly oxygenised secretions are suspended, their essential constituents being formed only in very minute quantities during that stage, on account of the defective supply of oxygen.

"*Explanation of the great temporary Relief resulting from the Injection of a Hot Saline Solution into the Veins.*—No theory of collapse can be considered complete which does not give a satisfactory explanation of the great temporary benefit which immediately follows the injection of a hot saline solution into the veins. I have before referred to this subject (see *ante*, p. 251); and I deferred my explanation until I had given some account of the phenomena of collapse.

"I have adduced many facts and arguments in proof of the position that the essential cause of collapse is an arrest of blood in the lungs, occasioned by a spasmodic contraction of the muscular walls of the pulmonary arteries. If this be the actual cause of collapse, we might, *à priori*, expect that for a time it would be removed by the injection of a hot fluid into the veins. The temperature of the fluid injected by Dr. Mackintosh varied from 106° to 120°; but he states that "the good effects of the injection were rapid in proportion to the heat of the solution." (*Op. cit.*, vol. i, p. 365.) The hot fluid, rapidly mixing with the blood in the right side of the heart and in the pulmonary artery, would as it were dilute the poisoned blood and render it less irritating, just as diluents render the urine less irritating to an inflamed bladder or urethra. It is probable, however, that the chief action of the injection would be to relax the spasm of the minute arteries by its high temperature.* Thus, the impediment to the circulation being overcome, the blood rapidly flows on to the left side of the heart and the arteries, and the phenomena of collapse pass away with marvellous rapidity. The benefit, however, is of but short duration; for the primary cause of the impeded circulation—namely, the

* Dr. Parkes, who tried the injection in some cases, states that he did not see even the temporary vivifying effects which others describe. (*Op. cit.* p. 219.) The probable reason of this is, that the temperature of his injection was too low. In one case, he says it did not exceed 98°; while in another it was "tepid". In the other cases, the temperature is not stated. I think, therefore, that Dr. Parkes's failure to do good by a tepid injection is confirmatory of my view, that the high temperature of the injection employed by Dr. Mackintosh and others had more influence than the mere mixture of water with the blood. I believe that the hottest room of the Turkish bath would quickly relax the spasm of the pulmonary arteries; and so, if it did not cause faintness, it might be a real help to recovery.

poisoned condition of the blood—being still in operation, and the originally hot solution being cooled down by its diffusion through the entire mass of the circulating blood, the stream of blood through the lungs will soon again be obstructed ; and the patient thus passes into a state of collapse as profound as and more hopeless than before. It appears, therefore, that the hot saline injection into the veins, and the operation of venesection, when it rapidly relieves, as it often has done, the symptoms of collapse, have this effect in common, that they facilitate the passage of the blood through the lungs, and thus lessen that embarrassment of the pulmonary circulation which is the essential cause of choleraic collapse. But, whereas the hot injections act by removing the impediment which results from spasmodic contraction of the arteries, venesection acts by relieving over-distension of the right cavities of the heart, and thus increasing the contractile power of their walls.

"In concluding this communication, I would implore those pathologists who have hitherto thought that the temporary benefit following injections into the veins affords conclusive evidence that collapse results from loss of water, to consider whether the explanation here offered is not at least as probable, as complete, and as consistent with all the known facts of the problem, as that which is commonly received."*

These views of the pathology of cholera will be seen to agree very much with those of Dr. Bell, but we think that Dr. Johnson *localises* the arterial spasm too much to the pulmonary arteries. It is well known that Dr. George Johnson strongly advocates purgatives in these cases, to eliminate the poison. We think his success may be encouraging, but his explanation is not, to us, satisfactory. We would by no means discourage either vomiting or purging, but in most cases nature herself does quite enough in this way, without being assisted.

Dr. G. Wallis, of Clifton, Bristol, believes that cholera is produced by the decomposition of animal and vegetable matter. He does not regard it as contagious. He says :—

"It is true that women who washed the soiled linen of those who have died of this epidemic sometimes were affected by this disease ; but it must be remembered that heat and moisture conveyed the poison to the lungs. All those who are weak, irritable, and highly susceptible are often knocked down at once by the deleterious atmosphere of cholera ; but stronger persons who have not stayed too long in the tainted air recover. This fact accounts for the uniformity of the mortality in the different countries over which it passed, and the different modes of

* British Med. Journal, Nov. 11, 1865, p. 491.

treatment which have been adopted in the various places. So that medical treatment can do nothing in some cases; they either die or get well, according to the strength of the vital power or the force of the poison on weak habits. Medical aid can only be useful in such cases as are on the balance, and are struggling to continue the vital functions. Sanitary measures are, no doubt, useful, because all malaria add to the destructive power of the epidemic.

"The cholera never appeared in this country until the year 1832, although malaria of various kinds were extensively in existence; cesspools, stagnant ditches, and manure heaps were far more commonly distributed over the whole country then than they are now or have been since 1832; so that malaria has nothing whatever to do with the production of cholera. Poverty and overcrowded rooms may produce low fever, but they never produce cholera or typhus fever. This is an impossibility, for these diseases are produced by specific agents.

"The phenomena which are exhibited when the deleterious air has been drawn into the lungs are these: The great gastro-pulmonary nerve is either wholly or partially paralysed; the consequences are the cessation of all its functions, either wholly or partially. This great nerve is a nerve of function, and performs the functions of digestion and respiration, and influences all secretions. Air is drawn into the lungs, and is expelled in the same state as it was when taken in, except its having been in contact with a moist animal surface; that air remains cold, and there is no secretion of carbon (the essential principle of respiration), so that this process of the vital actions is, in effect, abolished, and the skin assumes a blue colour. The muscles which draw the air into the lungs remain unaffected, and continue their action. In most cases (when the victim is not at once destroyed) the bowels act once largely, and then all secretion is suspended. It will be seen at once that remedies can be of no use in stopping the progress of this disease; except when the vital powers are struggling to continue their functions, they may be assisted by helping them to overcome the difficulties that obstruct them.

"The most painful effect of this disease is the universal spasm or cramp which pervades the whole body, and this arises from the condition of the stomach. Although fighting symptoms is a very bad mode of contending against a disease, yet relieving pain, and so far lessening the evils of the sufferer, is a legitimate object of humanity. As the air which produces this disease is limited, the sufferer should be at once removed to a purer atmosphere. The most effective remedy in relieving all spasms is the spirit of turpentine, one drachm of which is an ordinary dose, but its quantity must be suited to the object

required. It is not intended to recommend remedies for the relief of cholera; it is merely intended to be a guide to younger men in the consideration of this formidable epidemic. No epidemic can be contagious, as the state of the air breathed is the exciting cause of this disease. Ignorance alone produces fright, and fright magnifies all horrors."*

We agree with Dr. Wallis that in almost all cases, *at the very commencement*, this spasm or cramp exists more or less, but this may pass off so rapidly, and be followed by such complete collapse, that it may even escape the notice of the physician. His success, however, depends on this knowledge of the nature of the attack.

Dr. W. G. Maxwell, of Calcutta, corroborates many of the foregoing remarks:—

"The development of the stages of fever entirely depends on the changes the leaven has effected. If this change has been such that the blood has become too thick to flow through the lungs, then, as a matter of course, the collapse stage is developed in excess; in other words, cholera asphyxia is exhibited. The blood, unable to pass through the middle passage into the arteries, collects and swells out the veins, giving that deadly or blue colour to the skin. When the vomiting and spasms come on, this mass of blood in the veins is squeezed with great force, and hence the clammy moisture that is forced from every part during these fits. There is no pulse, because there is no blood in the arteries. There are also lethargy and langour, and oppression in breathing, caused by the blood being all collected in the veins. These make up the principal links of the chain of mechanical symptoms."†

Dr. Maxwell had a violent attack in his own person and found the greatest relief from effervescing soda powders mixed up in large quantities of water. He took fifteen tumblers full of this effervescing draught with the greatest relief although frequently vomiting them as soon as taken.

Another valuable paper is by Dr. Massy. He says:—

"The symptoms increase if not checked by medicine; cramps of the most violent description come on, chiefly in the feet, calves of the legs, thighs, and hands, which cause such excruciating torture, that I have rarely met even the most resolute able to resist screeching out. The skin now becomes quite cold, assumes generally the blueish hue so remarkable in cholera, and in a short time you will find it corrugated in almost every part, reminding one exactly of a woman's hand after washing for

* Lancet, Nov. 11 1865, p. 544. † Retrospect, Vol. xviii., p. 389.

several hours. You will also be struck by the very peculiar countenance of the patient; the features are all sharpened; the eyes sunk in the orbits, but starting wildly; the tongue, if you place your finger on it, will be found quite cold; the patient's breath, if he breathes on your hand, is also cold. I shall never forget the first time a man in the advanced stage of cholera breathed on my hand—it actually made me start, it was so much colder that the atmosphere; all this time the patient screams out for cold water to drink: if you ask him is he cold, he says no, he is burning hot, he wants something cold to drink. I never actually tested how much a man in this state would drink, but fancy it would be something enormous, for he generally throws it up as fast as he drinks it;—sometimes, one would fancy, by a spasm of the œsophagus, for it has hardly time to reach the stomach, and still while he is vomiting he stretches out his livid hands, crying more, more!

"The treatment of this case depends in the first instance on bleeding, and largely, if the patient's pulse is good, giving at the same time twenty grains of calomel with one of opium. This, I think, will be found the best practice, at least we found it so in the hospital of the 31st Regt. Often have I seen the purging and vomiting cease almost instantaneously. The calomel and opium in the first place act as an immediate sedative, and the bleeding relieves the circulation more than purging, removing a mass of blood instead of depriving it of its fluid part. After twenty minutes give ten grains more of calomel and half a grain of opium; this will further prolong the cessation of the symptoms, and in about an hour you will find the calomel acting freely on the liver, when quantities of bile will be passed by stool. When it has acted in this way for some time you may give opium, but not till then: of the various species of practice I have seen tried, I think a reliance on opium in this form of cholera the most faulty: you may exhibit any amount of opium, while a man is purging and vomiting white fluid, without producing a single sign that the medicine has been swallowed,—the purging and vomiting still continue. If you happen not to see your patient (as is too often the case among soldiers) until the disease is farther advanced,—until his voice is changed, pulse a good deal reduced in strength and frequency, features sunken, temperature reduced, skin blueish, tongue cool, &c.,—I would recommend the bleeding to be smaller. You may be able to repeat it; but, as you draw blood, stimulate, give punch, brandy, or wine and water, or carbonate of ammonia. Apply friction, with stimulating and hot liniments to the extremities, warm sand-bags to the feet, sinapisms to the calves of the legs and pit of stomach; for if once you can raise the pulse, the chances in favour of recovery

will be vastly increased. I have seen more than one case where the pulse improved after this treatment and again fell away, when it was deemed advisable to take blood a second time with decided advantage, stimulating at the same time. Cases of this kind cannot endure the loss of blood, even in small quantities, without stimulants. This we learned by sad experience at Umballa; most of the cases we bled in this stage sunk without a rally. We were about to condemn bleeding in cholera, when once the symptoms of collapse set in, but we tried stimulants together with the bleeding, and found the practice the most successful of all we adopted."*

In this paper Dr. Massy points out the practice of bleeding and stimulating at the same time, that is, relaxing the cramps and spasm of the arteries, and judiciously keeping up the powers of nature while this depressing treatment was carried out. This can be done beautifully by substituting chloroform for bleeding, and even by combining the internal administration of compound spirit of ammonia and good large doses of chloric ether. The chloric ether, being made from chloroform, acting as it were both as a stimulant and sedative, or antispasmodic.

We have placed before our readers some of the most valuable papers on this dreadful disease, and we will now endeavour to *pick out* from them and other papers some of the best modes of

Treatment.

We cannot but think that the most serious mistakes have been made in the treatment of cholera, chiefly owing to not knowing what cholera really is. Let us first point out some of what we consider the most sensible explanations of its pathology. Our opinion is, that it consists in a tonic rigidity, spasm, or tetanic contraction of nearly all the arteries of the body, caused by some violent poison acting on the organic nerves, the sympathetic, and all its branches and connections. The small terminal arteries and capillaries being thus spasmodically contracted, the blood is driven inward upon the great veins. Dr. Bell says:—

"When this has reached to such a point as to oppress the action of the heart, yawning first, and then shivering, or a sense of suffocation and pain in the præcordia, are the indications of oppressed circulation, and of the commencing effort of the heart to overcome the mass of blood which is stifling it. If, by the application of tourniquets to the limbs, or by bleeding, part of the blood which is rushing from the extremities to increase this congestion is prevented from reaching the great

* Retrospect, Vol. xvii., p. 127.

veins,—the heart, excited to increased action, is enabled by this relief more quickly to overcome the obstruction and restore the balance of the circulation, and the paroxysm passes off. If not thus mechanically aided, the heart, after a severe struggle to maintain the circulation during the period of constriction, is at length relieved, by this nervous disturbance or spasm of the capillary circulation passing off of itself, and then the heart and arteries, so long excited by the struggle, maintain for a time their increased action after the obstruction in the capillaries is removed, and produce apparent febrile action. Presently this excitement subsides, the vessels become relaxed, and sweat succeeds. The vessels continue in this state for a longer or shorter period, according to circumstances, till they at length recover their ordinary tone and action in the intermission. This fever, however, is not fever properly so called, but reaction; and the sweating not critical or essential, but relaxation. The cold stage is alone essential, and is the physiological cause of the subsequent stages."*

"Collapse, if it mean anything, surely means a sinking from the cessation of the power which supported the vital actions, but the more the condition so called in cholera is examined, the more, I am convinced, it will be found that it arises from an active cause controlling these powers; that, if collapse from sinking or hemorrhage may be termed adynamic, we shall be forced to express that which occurs in cholera by the contradictory term dynamic; that it is an active, not a passive, condition of the capillary circulation. It is obvious that, if this distinction be not made by the practitioner, he will inevitably attempt to treat collapse in cholera on the same principles that he would adopt in an apparently similar condition of the system proceeding from a deficiency of action. It is true that both in adynamic collapse with sinking and syncope, and in that of cholera, which I have termed dynamic, there is diminished circulation and arterial action; but in the first the pulse is open, soft, and feeble, and unless proceeding from hemorrhage, becoming generally slower, softer, and feebler, till it ceases; whereas in cholera it is contracted, small, and wiry, as long as it can be felt."†

"At the same time that the blood over-distends the cava and oppresses the heart, being still poured inwards from the extremities to which their well-valved veins permit no regurgitation, it is necessarily driven back from the gorged vessels upon all the internal venous branches unprovided with valves; the renal veins are distended, and the returning current of blood from the kidneys stopped; consequently a first effect or symptom of

* Dr. Bell, Retrospect, Vol. xvii, p. 109. † Ibid, p. 111.

such congestion is the cessation of the secretion of urine, and the first urine passed on recovery from cholera is often mixed with serum and blood-globules. In like manner the hepatic circulation is oppressed, impeding the secretion of bile; these two constitute the second class of mechanical effects or symptoms. At the same time another effect is produced by the same cause: the portal circulation, at first impeded by meeting the reflux from the vena cava, is presently reversed, and the blood is thrust back into the mesenteric veins, till it distends their extreme ramifications on the mucous membrane, where it finds a species of vent; for from this surface the repellant force squeezes out the fluid portion of the blood into the bowels, carrying with it the mucous epithelium, and constituting that serous or rice-water evacuation which is esteemed characteristic of cholera, but which has no title whatever to thename of secretion, or to be treated as such, being a mere exudation which is the very reverse of a vital action."*

There is one important omission in the explanation of Dr. Bell which is well filled up by Dr. Johnson, of King's College. According to this view of Dr. Bell the blood is forcibly sent into the great central veins, and Dr. G. Johnson beautifully explains *why it is kept there and cannot get any further.* If the road had been clear and uninterrupted through the lungs, the blood would easily have got round to the left ventricle, and have again gone its round, but it is stopped by the spasmodic contraction of the minute branches of the pulmonary artery which will not even allow the blood to enter the pulmonary capillaries, as shown by the remarkable anæmia of the texture of the lungs.

"The one great central fact is this, that, *during the stage of collapse, the passage of blood through the lungs from the right to the left side of the heart is, in a greater or less degree, impeded.*"†

"The tissue of the lungs is, in most cases, of pale colour, dense in texture, and contains less than the usual amount of blood and air. With respect to the extremely anæmic condition of the lung, when death has occurred during the stage of collapse, there is an entire agreement amongst those authors who have most accurately described the *post mortem* appearances. There is something surprising as Briquet and Mignot observe (*Traité Critique et Analytique du Cholera Morbus*) in the contrast between the almost constant occurrence of this extremely anæmic condition of the lung, from which scarcely even a few drops of blood flow when the tissue is cut, and the hyperæmia of most of the other viscera."‡

* Dr. Bell, Retrospect, Vol. xvii, p. 113.

† Dr. Johnson, British Med. Journal, Nov. 11, 1865, p. 491. ‡ Ibid, p 491.

This anæmic state of the lungs, however, only continues during the stage of collapse. When reaction follows, the lungs become gorged with blood, while we suspect the other viscera are more or less relieved by the circulation going on once more. Thus the blood is driven inwards from the general capillary circulation, and prevented from getting further on account of the similar contraction of the pulmonary arteries. On the clear understanding of this one point we think depends the whole success of the treatment of the first stage of cholera; and with this view before us we can see the great success which has attended certain modes of treatment. Dr. Bell explains his success by bleeding, by supposing that he thus diminishes the quantity of blood in the great central veins, but this is not a correct or scientific explanation. The bloodletting relieves the spasm of the capillaries, emetics act in the same way, and even the encouraging of the vomiting by water relaxes muscular spasm in the same way as ipecacuanha, antimony, belladonna, and aconite, and in a similar manner we think that the injection of warm water or salines act. But it is to *chloroform* that we especially wish to direct the attention of our readers, and to the cases which have been cured by this wonderful agent. We ought always to remember that the period of spasm is not uninterrupted, it comes and goes like tetanus; although perhaps always, more or less, existing till nature fairly gives way, and then we have complete prostration and relaxation of all the muscular system, but (if the patient live long enough) with a consequent reaction in the circulation, and congestion of those parts which were previously anæmic. Hence, if we bleed or nauseate, or use chloroform, these ought to be done *only during the period of spasm.* If the spasm be carefully and early overcome, without producing violent reaction by stimulants and other means, the cure of the cases is accomplished. Let us examine some of the most important measures resorted to in this early stage of this disease, for in this consists the great success.

Bleeding.—With respect to this mode of treatment the reader ought to notice particularly the following directions of Dr. Bell:—

"When the exudation from the bowels or skin is yet flowing freely,—for in different forms of the epidemic either symptom may predominate,—and when the heart is heard to be struggling in an extraordinary state of excitement, and in the active endeavour to overcome obstruction, it is *churning* as if it would burst,—a sound difficult to describe, but once heard, never to be forgotten,—when, I would say, the sound of the heart conveys to the listener the impression that it is labouring with unabated vigour of reaction, the lancet cannot be used too

promptly; but when the attack has continued for four or five hours,—when the purging has become less copious,—and when instead of manifesting a continuous struggle, the heart appears only to be roused up to reaction at intervals, when the natural warmth of the skin is a little more extended on the neck and chest, and the patient though still tossing uneasily, is not now in his previous agony, I would hold my hand and trust to medicine for some hours to come; I would then wait until I observed him rest a little more quietly, and bear the weight of the bed-clothes for a time, and until the heart's action continued comparatively tranquil for half an hour or an hour; then, indeed on the very first symptom of renewed distress, or even sooner, I would bleed without hesitation, till the thick tarry blood, that at the first is squeezed and kneaded from the arm with difficulty, flows freely from the orifice, and becomes changed to a fair florid hue.

"All depends upon the period at which bleeding is resorted to. If early in the congestive stage, or just previous to its second accession, it is invariably successful; if just as the congestive stage is passing off, when the pulse begins to acquire a little power, it is invariably fatal."*

This fact Dr. Bell explains in the following manner. In the first stage the heart is excited to the utmost by distension of its cavities from behind, and opposition to its action by spasm of the capillaries in front; bleeding gives relief from the pressure *à tergo*, and probably aids in relaxing the spasm, while at the same time by relieving the congested state of the great secreting organs, it enlists their sympathies in support of the vital actions; and the power of the heart being unimpaired, it can now carry on the circulation with vigour. But in the second stage, the heart's energy is much exhausted, and its vital irritability impaired, by long-continued distension; and syncope and relapse will be the probable effects of bleeding. If then we cannot bleed what are we to do? We must use those medicines which will invigorate and regulate the circulation generally, and control the tendency to periodical disturbance.

We think, however, that bleeding will never be a favourite remedy with British practitioners.

Emetics.—Ipecacuanha, tartar emetic, mustard-and-water, &c., are all more or less useful. The state of nausea relaxes spasm, and the act of vomiting seems almost, for the time, to stimulate, as well as to have the effect of nausea. Many of the most successful cases are those in which free vomiting exists encouraged by copious draughts of cold water or mustard-and-

* Dr. Bell, Retrospect, Vol. xvii., p. 114.

water. Nature herself often does this unassisted and for our own part we would never discourage vomiting.

Chloroform.—This we think will prove to be the most important remedy in the *early stage* of cholera. Chloroform has been found to be wonderfully efficacious in relaxing all kinds of spasmodic action. In epilepsy, tetanus, hysteria, puerperal convulsions, &c., we have found it to be invaluable. *Chloroform therefore will be a valuable remedy in the earliest stages of cholera*, and will, we think, supersede bleeding, emetics, and all other remedies. Its relaxing effects can be watched with the greatest nicety, and accompanied or followed, if *reaction does not come* on, by the very gentle and judicious use of stimulants. We find one of the earliest records of the use of chloroform in cholera in the 'Lancet' for Nov. 4, 1848, by Dr. J. Hill, of the Peckham Lunatic Asylum, who used it at the suggestion of Mr. F. Ferguson, the assistant-surgeon.

Dr. Hill says :—

"The following is our usual mode of treatment :—Place the patient in bed in warm blankets ; give a glass of brandy in hot water, with sugar, and spice ; apply friction to the body by means of warm flannels ; and an embrocation composed of liniment. saponis comp., liniment. camphoræ comp., tinct. opii, and ext. belladonnæ ; apply to the whole surface of the body bags filled with heated bran ; place the patient under the influence of chloroform by inhalation, and keep him gently under its effect as long as the bad symptoms recur, (which they frequently do on its effect ceasing and his regaining consciousness.) Give in the intervals small quantities of brandy-and-water, and thin arrow-root or milk for nourishment, along with milk-and-water, or soda-water with a little brandy for drink. Avoid every thing else in the shape of medicine, and trust to the efforts of nature in rallying from the poison of the disease.

"Of course great caution is necessary in administering the chloroform, and in not pushing it too far. In some instances the patient will sleep for twenty minutes or half an hour—in others, for several hours ; and on waking will again be seized with a return of the vomiting and cramps, when the chloroform must again be resorted to, and the patient kept in a great measure under its influence till these symptoms abate. One of our cases required its use at intervals for twenty-four hours. Again, the reaction after its use may be so great as to require gentle blood-letting ; which occurred in two of our cases, both being persons of full habit of body and sanguine temperament, the one a nurse, and the other a male farm servant.

"Should the simple apparatus commonly used in the hospitals for administering it be not at hand, a small teaspoonful may be poured upon a towel, and will answer very well."*

It would seem that chloroform acts well as a sedative given internally.

Mr. P. Brady, of Harrow, gives the following case:—

"Mary Parratt, aged 60, ordinarily enjoying good health, was on Saturday, the 29th ult., attacked with slight diarrhœa, for which the usual homely remedies were used. On the following morning at six o'clock a.m. the diarrhœa became profuse; excessive vomiting supervened, accompanied by spasms in the calves of the legs, fingers, and toes. Notwithstanding the urgent nature of the symptoms, reliance was still placed on the favourite remedy, brandy, without avail, however; the dejections became incessant, the spasms increased in intensity, and at nine o'clock a.m. on Sunday, the 30th ult., I was called in to see the patient, who, it was affirmed, was in a "dying state." Believing from the description given, that I should have to treat genuine malignant cholera, and having predetermined, should such a case present, to try the effect of chloroform administered internally, I took with me the following mixture:

℞. Chloroform, ℥j,; ol. terebinth., ʒj.; aq. dest., ℥iij. M.

"On my arrival I found the patient presenting all the symptoms of malignant Asiatic cholera in an advanced stage; the features collapsed and ghastly; extremeties and tongue cold; burning sensation in the stomach and œsophagus; pulse rapid and scarcely perceptible; voice diminished to a whisper; stomach exceedingly irritable, and the dejections from the bowels presenting the characteristic rice-water appearance; and all the voluntary muscles of the body were affected by spasm, so that the patient actually writhed in agony. I immediately administered a large teaspoonful of the chloroform mixture (containing about six minims of chloroform and forty of turpentine) in a wine-glass of dilute brandy, and applied sinapisms to the calves of the legs and abdominal and thoracic surface. Thirst was relieved by drinking plentifully of water, nearly cold. Notwithstanding the irritable state of the stomach, I had the satisfaction to find that the chloroform draught was retained, as well as the fluid drunk after it, and was followed by no dejection. I now (half an hour after the draught) gave two of the following pills:—

℞. Calomelanos, ℈ss.; fellis bov. inspis., ℈j. M. et divide in pilulas quatuor.

* Retrospect, Vol. xviii., p. 420.

"In an hour after the administration of the chloroform, vomiting ensued of a portion of the fluid drunk, slightly tinged with the gall; this soon subsided, the diarrhœa had apparently ceased, and the cramp diminished in frequency and severity. I now administered a second dose of the chloroform mixture, and soon after repeated the pills. The stomach retained both; she soon felt decided relief; the pulse rose in power and became slower, the spasms less frequent, and in an hour after the second dose she was bathed from head to foot in a warm perspiration, and expressed herself comparatively free from all uneasy sensations. The attack had been completely subdued, leaving behind a good deal of pyrexia and debility, from which she is now rapidly recovering."*

Mr. G. Plimmer relates another case of cholera in which chloroform was given as a medicine. He says:—

"I determined on giving chloroform, after giving hydr. chlorid. with opium, which was immediately rejected. I gave the following mixture:—Chloroform, ℥vj.; brandy, ʒiij.; water, ʒijss. I gave a third part, which was thrown up in half an hour; I gave him a second dose, which was retained; the vomiting and diarrhœa ceased; the spasm less severe. I gave him, in two hours, the remaining part, and during the next six hours I administered, in two doses, six minims more of the chloroform with the most decided benefit; and he is now, the 17th inst., convalescent. To the extreme tenderness over the region of the epigastrium I applied flannel soaked in rectified spirits of turpentine. I observed there was no urine secreted, and I am firmly of opinion that the usual remedies would not have met this case. I candidly confess I had no hope of success, from its severity, and, but for Mr. Brady's case, I believe I should have lost my patient."†

Mr. Steadman gives the following case of English cholera treated by the same remedy.

"About three o'clock on the following morning I was hastily aroused by her husband, as the patient had become much worse. All her symptoms had increased to an alarming degree: the spasm was universal and excessively violent, "as if knots were being tied in her bowels;" vomiting incessant; countenance livid and cold; articulation feeble, praying to be released from her sufferings. As all the medicines had been rejected, I thought it fruitless to continue them, but at once decided upon admin-

* Retrospect, Vol. xviii., p. 420. † Ibid, p. 421.

istering chloroform. A mixture composed of the following was prescribed :—

℞. Chloroform. gr. xiv.; aquæ vitæ (cong.), ℥j.; aquæ destill., ad ℥ vj. M.

"A fourth part was given immediately, which had a partial but most satisfactory effect: an abatement of all her symptoms was the immediate consequence. In two hours a disposition to a recurrence manifested itself, when a second dose of the mixture was administered, which entirely controlled all spasms, vomiting, and purging. She expressed herself "very comfortable," and fell into a quiet sleep. At nine o'clock I again saw her, and found her suffering only from some febrile symptoms, accompanied with much exhaustion. She was ordered cold rice and mucilaginous drinks, and had the chalk mixture with nitric ether prescribed. A dose of ox-gall (gr. x.) was given in the course of the day, which produced three bilious evacuations and some disposition to vomiting, which soon passed away. In two days she was declared convalescent. In 1832, when the cholera visited this place, my patient was attacked, but she declares her sufferings then were nothing in comparison with her late disorder. The two remaining doses of the chloroform mixture were ordered to be carefully preserved in case she had any return of her symptoms. A daughter, grown up, who had assiduously attended upon her mother, was on Wednesday evening seized in precisely a like manner, except that the dejections were more abundant and frequent; and the mother, without hesitation or appeal for advice, gave her the two remaining doses of the mixture. The same magic result followed; the first dose was only partial in its effect, but the second completely subdued the disease. When I called on Thursday, the gratifying announcement was made to me of the success of my medicine in a second case.

"Perhaps I am not justified in ca ling these decided cases of Asiatic cholera, but the disease in its latter stage, in the case of the mother, assumed a much more severe type than our English form usually bears.

"Without offering any remarks upon the *fons et origo* of the malady in its worst form, and with prospective fears for its soon visiting our shores, I am but too happy (in conjunction with Mr. Brady) in being able to report so favourably of a remedy which I believe only requires to be more extensively tested to be appreciated."*

In the "Reports on Epidemic Cholera, drawn up at the desire of the Cholera Committee of the Royal College of Phy-

* Retrospect, Vol. xviii., p. 422.

sicians, by W. Baly, M.D., and William Gull, M.D.," the treatment by chloroform is copiously referred to, but, with all deference to these eminent physicians, we think that there is not sufficient emphasis placed on its effects as an antispasmodic. By many it was given more as a stimulant than an antispasmodic, moreover it was often given too late, when collapse had too much set in. Although the poison of cholera seems to act primarily on the ganglionic nerves, almost paralysing them, yet at the commencement of the attack the heart and other muscles are in a state of almost tetanic continued spasm; but this continues a very short time, and if not relieved, is followed by the real collapse, in which stage the powers seem to be exhausted and death soon follows. Bleeding, chloroform, emetics, and all other antispasmodic and exhausting remedies ought only to be used when we want to effect relaxation of cramp and other spasmodic action of the arterial system, the intestinal organic muscles, the muscles of respiration, voice, &c. Hence we find in most of the reports of cases, that the *time* to use these remedies is not carefully pointed out. In the Cholera Reports of the College of Physicians, Dr. DAVIES gives one case in which he used chloroform fifteen hours after the seizure, with relief but not success; we think that it was used too late. He further says:—

"In 22 cases, as severe symptoms came on, the chief remedy was chloroform administered internally in doses of from seven to ten minims every hour, half hour, or quarter of an hour, according to the severity of the symptoms, but of these 22, 8 terminated fatally, and 14 recovered."

Dr. Davies (second report):—

"Out of 9 cases of cholera, and 13 of the worst cases of diarrhœa, occurring in my own practice, and treated with chloroform, one died. All these were in the better ranks of life. In some of them, the warm salt-water bath was used as an auxiliary, and the diet consisted of nothing but cold milk and water, with some carbonate of soda ad libitum. The fatal case was that of a drunkard, who probably did not take the remedy.

"These cases varied in degree of severity, from sickness and diarrhœa, and some account of collapse, to sickness, diarrhœa, severe cramps, and great collapse, with almost clear watery evacuations passing away involuntarily.

"Of 14 cases of cholera treated by my friend, Mr. Towers, Medical Resident of the Infirmary, many of them under my observation, one died. The fatal case was that of a woman, aged 63, in a state of great destitution."

Dr. Davies (third report) :—

"It will probably be remembered by the committee, that in my second report, I expressed a very favourable opinion of chloroform in this deadly malady. I considered I had strong grounds for so doing, after observing the large proportion of cases which recovered under its administration. From the history of this last visitation in the county prison, however, the fact turns out, that, under some uncertain circumstances, the use of chloroform will not prevent the proportion of deaths being considerable. I have reason to believe that it was, from over anxiety, given in too frequent doses in some cases, and that it thus rather added to the coma, which is one of the characteristics of the malady.

"At the commencement of the outbreak, the doses were repeated every hour, or every two hours, and it is to be noted, that the first 7 cases recovered. As the cases multiplied, the remedy was given every half hour, and in some instances, every quarter of an hour; the result was, that the next 6 cases died. Whether these cases had anything in them inherently more fatal, it is difficult to tell; the symptoms at first were about equal, and the differences did not show themselves until towards the end. There was next a recovery of 7 cases in succession; in these the remedy was administered less frequently, but subsequently 2 deaths occurred under the less frequent administration.

"The chloroform was administered also by inhalation in some of the more severe cases of cramps, with the effect of affording relief in every instance. The inhalation was not carried so far as to produce perfect insensibility.

"Although I am still of opinion that chloroform, properly regulated, is the remedy, of all others hitherto tried, to be depended upon, yet it cannot be considered as a 'specific' for cholera. In one of my fatal cases the chloroform mixture had been taken for two or three days, about every four hours, during the stage of diarrhœa, yet the patient sank rapidly into collapse, and died in two days."

Dr. Davies' subsequent statement :—

"I found that no reliance could be placed on chloroform alone. It is true the cramps and pain were greatly relieved by it if the inhalation was carried so far as to produce insensibility, but the course of the disease did not seem to be at all impeded."*

Now we think that Dr. Davies was more successful than he himself thought: and if chloroform be used very early so as to keep off all spasm, and at the same time stimulants be very

* Cholera Reports, p. 192.

carefully given if the pulse do not rally, we think that success will be great.

Hot Mustard Bath.—An interesting case relieved by this remedy is just related by

Dr. BULLAR, who says :—

"The patient was in the collapsed stage of cholera. His naturally red face was of purple blue ; his surface livid, cold, and shrunken, with the washerwomen's hands. He had rice-water vomiting and purging, was doubled up with abdominal pain, and writhed with cramps in his calves, drawing the strands of his gastrocnemii muscles into rigid cords, which the nurse and porter were rubbing to ease his torture. His pulse was barely perceptible. No urine had been passed since his attack.

"No one who had seen the cholera of 1832 and 1849 could mistake the nature of such a case.

"Had a slipper-bath been available, I should have used one ; but as he had been placed in a house adjoining the Infirmary, and only used occasionally for infectious cases, where were only hip and foot-baths, I had him seated in a hip-bath half filled with very hot water with three-fourths of a pound of powdered mustard in it, with his feet in a hot-water foot-bath with a quarter of a pound of mustard mixed with it. The water was as hot as the nurse's hands could bear—almost scalding hot. That the water should not be merely warm, but very hot, and renewed by degrees to keep up the heat, is most important ; and the medical attendant should superintend this himself. Gradually his face improved in colour ; the cramps ceased ; he did not vomit ; and after half an hour, as he expressed a great wish to get to bed, and to pass a stool, he was moved to a close stool, dried, a clean shirt put on, and he was placed in bed, well covered with blankets, and with hot tins to his feet and hands. His pulse, though weak was not easily felt ; and his hands, though still cold, were warmer.

"The contrast was striking. When placed in the bath, he was writhing with pain and cramps ; when placed in bed, he said he was comfortable, had no pain, and wanted to sleep. Whilst in the bath, he drank freely of milk and water with lumps of ice in it ; and was urged to swallow in the intervals of drinking small lumps of ice. Shortly after being placed in bed, he suddenly ejected a large basinful of milk and water, and was not sick afterwards. An hour after he had been placed in the bath, reaction had so far advanced that there were good hopes, and four hours afterwards he was out of immediate danger. He was ordered to take iced milk in smaller quantities, to

swallow ice, and to have broth and tea. He had but one stool of rather a yellower colour the same evening. No reaction-fever followed; and, except weakness, he was on the second day well.

"Having seen, with Dr. Lake, a case of much less severity, in which reaction went on from the time he applied Dr. Chapman's ice-bag to the spine, I had one prepared; and, on his being placed in bed, it was applied; but, as it made him chilly and prevented sleep, it was not persevered in. This coldness from an ice-bag is a proof that reaction has occurred, and that it is not needed."*

In this case the hot mustard bath was beneficial not only in restoring the capillary circulation to the skin, but in relaxing the spasm of the organic muscles generally, but as Dr. Bullar truly remarks, neither this nor any other remedy will avail when the dose of the poison has been so virulent and so large that "the disease begins with death."

Calomel.—The treatment by calomel was at one time much praised, but we think that it did not deserve all the praise given to it. It was certainly a better treatment than that by opium and stimulants, which was then much practised. It left the cases more to nature.

Cold Water.—This is one of the best remedies. The patient will drink enormous quantities, and perhaps vomit it as rapidly as he drinks it. Nevertheless it ought to be taken copiously and without restraint. Effervescing draughts in large quantities are an agreeable form.

Consecutive Fever.—It is too true that even if the first stage of cholera be got over, the patient frequently sinks from the consecutive fever, but we think that the more easily the spasm is overcome, the less stimulants, opium, and other violent treatment be adopted, so much the milder will be the reaction, and consequent fever.

We have not space left us in this volume to dwell at large on the treatment of this stage of the disease. A great number of interesting papers on cholera will be found in our previous volumes. See *Retrospect*, Vols. 17 and 18.

* British Medical Journal, Oct. 21, 1865, p. 416.

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